INDIA'S RICE REVOLUTION

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INDIA'S RICE REVOLUTION

An Account of the introduction and Achievements of the Japanese Method of Paddy Cultivation in India

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INTRODUCTION

Staple diet for more than 50 per cent of the global population, rice is the world's most important food crop. Of its total area and production, 90 per cent. are centred in South and South-East Asia. World War II shattered the economy of these countries, and in the disturbed years that followed, rice production dropped in these areas.

In the wake of a variety of factors, India, too, had to face near-disaster. Trouble brewed on her foodfront way back in 1943, with Japan's entry into World War II and the aftermath of military operations in Burma. The threat lay in the ominous possibility that India might be cut off from Burma and supplies of rice from that source would, in that event, be sealed off.

Burma had long been a supplier of rice to India. In April, 1937, when Burma was separated from India, imports of rice from that country ranged between one-and-a-half to two million tons annually. These supplies served the dual purpose of augmenting internal supplies, and regulating prices. With the imminent danger of supplies from Burma being cut off and the onset of famine in Bengal, food situation in India became very acute in 1943. Aware of the serious crisis on the food front, the Government of India outlined measures to offset the threat of scarcity. These marked what has since been looked upon as the first phase of the country's Grow More Food campaign.

Gears got jammed again when, with the achievement of Independence in 1947, India had to face new problems on her food front. For as a result of partition, which came with Independence, India lost supplies of about seven to eight lakh tons of foodgrains. New measures were adopted to meet the threat of recurring food deficits.

As pointed out earlier, rice production dropped during World War II in most countries. But the tide turned in 1953, with a sharp rise in production. In 1954, it touched an all-time record, when 8.5 million additional tons were harvested than in the previous year. And by far the largest total increase was secured by India, where seven million additional tons of paddy came in at harvest time. This additional gain constituted an increase of 20 per cent over the previous year—a more than significant

achievement as the area under paddy had gone up only by three per cent. Higher yields per acre had led to increased production and near self-sufficiency.

How did India achieve this record production of rice? It is a saga of planning plus.

Grown almost all over India under varied climatic and soil conditions, paddy takes up a third of India's cultivable area. Earlier, on an average from some 70 million acres came about 21 million tons of rice—annually.

Even so, the paddy areas are mostly concentrated in the States of Bombay, Madras, Madhya Pradesh, Bihar, Orissa, West Bengal and Uttar Pradesh. Over 90 per cent of India's rice production is made up by these States.

Indian farming has suffered from one chronic snag all through. For the average acre yields of India's principal food crops, including rice, are disappointingly low. Compared with corresponding yields in foreign countries, the picture of India's rice production that emerges is almost dismal.

While, in recent years, the average per acre yield in India stood at 700 lbs., Europe had 2,830 lbs.; Japan 2,350 lbs; Africa 1,890 lbs; Korea 1,950 lbs ; China 1,550 lbs ; Indonesia 1,030 lbs; and the United States of America 1,390 lbs. Evidently, the South-East Asian countries were jumps ahead of India in rice production.

Why does Indian rice production lag behind ? The question has loomed large betimes : some answers had been available, until a critical assessment of the rice production techniques in the South-East Asian countries laid bare the secret of their higher yields. The answering logic was simple, yet incontrovertible. The rice-producing South-East Asian countries were making greater use of organic manures combined with intensive use of fertilisers. As simple as that.

Take China or Japan, for instance. Very great importance is attached in these countries to the preparation of compost and the utilisation of night-soil as manure. In China, as much as 67 per cent of the nitrogen applied to the soil is in the form of compost.

Conditions in India, however, were somewhat different. For one thing, the Indian farmer depends almost exclusively on farmyard manure. For another, even farmyard manure is not available in abundance, most of it going the way of fuel. And every year, still smaller quantities of plant nutrition are added to the soil by way of farmyard manure,

while the growing crops continue to deplete the soil, in an increasing measure, of its fertiliser elements.

Succinctly put, the factors which hold up higher crop yields in India are three-fold: Inadequate irrigation, insufficient use of manures and fertilisers, and improper care of crops at all stages of growth. These make the unholy trinity—the first, sometimes, an act of Providence ; the last two, follies of man.

Low use of manures and fertilisers consistently leads to the impoverishment of the soil of its essential plant nutrient elements, impairing fertility status irretrievably. Addition of organic manures and fertilisers in necessary doses steps up fertility and with it per acre yield.

Experimental evidence from all parts of India supports these theoretic postulates.

As soils go, Indian soils are deplorably deficient in nitrogen, phosphorus and organic matter, but they respond quickly to the application of these elements, so essential to soil fertility. Increases in yield, in actual trials, have ranged from 20 to 200 per cent, depending on the soil, variety of paddy sown and manures and fertilisers used. The accumulated wealth of research and experiment both alike point to the vast potentialities of increasing yields of paddy, if only the correct equation of fertiliser responses is given due heed.

The problem of low yields has been engaging the attention of the Government of India for some years now. Attempts have been made to popularise greater use of fertilisers by way of granting subsidies. These measures had met with some success, but still the insistently nagging problem of low average acre yields persisted.

Finally, out of the blue, as it were, the first hint of a solution came humbly from a village experiment in Bombay. The new approach to paddy cultivation was based on techniques adopted from Japan. Here, in these pages, is the story of that new approach—the Japanese Method of Paddy Cultivation—now successfully tried in several paddy-growing tracts of India.

New Delhi,

15th November, 1956

P. S. Deshmukh
Union Minister for Agriculture

CHAPTER I

BIRTH OF A NEW IDEA

With more than usual interest, the handsome Japanese professor looked across the table at the two Indian visitors. "Yes, we could arrange that," he told them, encouragingly, "say, a half-acre plot somewhere nearby."

That interview—and the helpful promise that followed—have become part of history today so far as India is concerned. The scene was at Hammatsu, the year 1951, when Sri Pranlal Kapadia and Sri Harish Chandra Patil, members of the Board of Management of the Kora Gramodyog Kendra, an institute near Bombay, had called on Dr. Iwao Kamo, world famous paddy expert, to learn the techniques of paddy cultivation practised in Japan.

Both the interview and the residual discovery were partly accidental.

Early in 1951, the Government of Bombay had sent a delegation, led by Sri Pranlal Kapadia, to Japan to study agriculture and cottage industries in that country. While in Japan both Sri Pranlal Kapadia and Sri Harish Chandra Patil were intrigued by the high yields obtained from the paddy cultivation techniques practised in Japan. Painfully aware of the dismally low average acre yield of paddy in India, they decided to approach Dr. Iwao Kamo to learn every aspect of the Japanese Method of Paddy Cultivation.

Dr. Iwao Kamo, whom they interviewed, knew that the easiest way to learn the new method—how the Japanese grew their paddy—would be by practical demonstration, picking up the know-how, step by step, on a farm of their own. So he arranged for a half-acre plot near the residence of the Indian visitors, where they could raise the seedlings, sow and look after them the Japanese way, and see the results for themselves. And all this they did according to plan.

Back in India, the knowledge gleaned from Japan proved extremely useful in the experiments tried at Kora Kendra headquarters by Kapadia and Patil. From the

experimental plots, making use of the Japanese method, Kapadia secured 8,000 lbs. of paddy and Patil 12,000 lbs. against the average Indian acre yield of 750 lbs. !

Here was something opening up vast potentialities of pushing up rice production in India.

Not much later, the President of India, Dr. Rajendra Prasad, showed keen interest in the new method and its results at Kora Gramodyog Kendra. So much impressed was the President with the results achieved that on September 19, 1952, he wrote a letter to Dr. Panjabrao Deshmukh, Union Minister for Agriculture, Government of India, who had taken over the portfolio only five weeks before :

"I am herewith sending you (wrote the President) a report which I have received from Sri Vithal Das Gerajani, who is running a Gramodyog Kendra on behalf of the Bombay Upnagar Gramodyog Samaj at a place called Shimpavli, P. O. Borivili, District Thana. It appears that the experiment, which has been made in connection with paddy, deserves encouragement. I trust it will receive your attention and this department will look into this and see if the results can be utilised in other parts of the country also. They are going to have a sort of exhibition or demonstration of the work being done there from September 23. It might he worthwhile if some one should see the work going on there and assess the correctness of the claim made by the experiment."

The Union Minister for Agriculture acknowledged the President's letter in these words:

"Many thanks for your letter of the 19th September as well as the note regarding the work done by the Gramodyog Kendra in the matter of paddy cultivation. I am having the matter looked into."

Close on the heels of these developments, the Union Minister for Agriculture, made contacts with the Bombay State Department of Agriculture and the Kora Gramodyog Kendra to secure data regarding the experiments carried out by them. Soon after, all available data regarding experiments based on the new method of paddy cultivation already carried out, came in a detailed note. It gave in a nutshell what the new method was:

"Both Sri P. S. Kapadia and Sri H. C. Patil have visited Japan and have studied the method of paddy cultivation followed in that country (said the note). Sri H. C. Patil is the Superintendent of the Government Agricultural School at Kosbad, Thana District, and was specially deputed by the Government of Bombay for making a detailed study of rice cultivation in Japan. The main features of the Japanese Method of Paddy Cultivation are as under:

(1) Raised seed-bed for growing rice seedlings ;

(2) low seed-rate ;

(3) heavy manuring of the crop in the seed-bed and in the field ;

(4) transplanting paddy in rows in the field ;

(5) transplanting 4-5 seedlings per bunch ; and

(6) interculturing in the rice fields.

"The advantages of raised and narrow seed bed for growing rice seedlings are being advocated by the Bombay Agricultural Department, which has issued a leaflet on this subject. As regards the low seed-rate, recent experiments on spacing-cum-seedlings per bunch in transplanted paddy carried out in Bombay have shown that the best practice in the Thana and Kolaba districts, where Sri H.C. Patil and Sri P.S. Kapadia are demonstrating the Japanese Method of Paddy Cultivation, is a spacing of 8 inches by 8 inches with 8 seedlings per bunch. According to these results, the minimum seed rate works out at 25 to 30 lbs. per acre as against the seed rate of 10 lbs. advocated by Sri H.C. Patil.

"According to the existing practices in the Bombay State, there does not seem to be much scope for reduction in the seed-rate. Regarding the number of seedlings used per bunch, the experimental work shows that the number of seedlings per bunch depends upon the incidence of crab trouble in the fields and the intensity of rainfall in the season. However, the Agricultural Department of the Bombay State is still investigating this subject, but the experimental results obtained so far tend to the view that 6 to 8 seedlings per bunch give the the highest yield if other conditions are favourable. The practice of manuring paddy is fairly well-known to the cultivators, but the prices of sulphate of ammonia and

bone-meal are the determining factors in the wide application of these fertilisers.

"The average yield of paddy in the Bombay State is 800 lbs. but it may be stated that the yield of paddy in the Thana and Kolaba districts, where the Japanese Method of Rice Cultivation is being demonstrated, varies normally from 1,700 to 1,800 lbs. per acre. The highest yield of paddy obtained in the prize plots in the Bombay State about two years ago was about 7,000 lbs. per acre.

"The Agricultural Department in the Bombay State has already undertaken a trial of the Japanese Method of Paddy Cultivation versus the local method of cultivation at the Rice Breeding Station, Karjat. The results of these experiments may be awaited. It may be observed, however, that when I visited the Agricultural School, Kosbad, last year, I was greatly impressed by the stand of the rice crop grown according to the Japanese Method of Cultivation, but it still remains to be seen whether the Japanese Method of Cultivation is economical, considering the cost of labour involved in carrying out the method and of the fertilisers used in manuring the fields. I shall try to obtain the results of the experiments being conducted by the Agricultural Department in Bombay and submit these in due course."

About this time a delegation of the Directors of Extension from different States led by the Vice-President of the Indian Council of Agricultural Research was in the United States of America to observe organisational method of extension work. The delegation was also due to visit Japan. The Union Minister for Agriculture, therefore, seized the opportunity and instructed the delegation to visit the places where the representatives of Kora Kendra and the Bombay Government had done field work previously, in order to satisfy themselves about the feasibility of adopting the method which an average Japanese farmer uses in growing paddy.

In a letter which the Union Minister for Agriculture wrote to the President of India on October 19, 1952, he referred to the work done by the Gramodyog Kendra in experimenting with the new method of paddy cultivation, and said:

"I have since consulted our Agricultural Commissioner, who was till recently the Director of Agriculture in

Bombay and who has first-hand information about the Japanese Method of Paddy Cultivation in the Bombay State. I am enclosing for your information copy of a note written by him.........We are pursuing this matter. When the results of the experiments initiated by the Government of Bombay at the Rice Breeding Station at Karjat to determine the comparative cost of cultivation of the Japanese and the local methods are known, we will take steps to exploit the approved methods. Meanwhile, I am arranging to get an article published in the *Indian Farming* about the salient features of the Japanese Method of Paddy Cultivation to stimulate interest among the farmers and research workers on rice.

"We have advised the Indian Delegation headed by Sri Damle, now visiting the U.S.A. and Japan, to visit the institution mentioned in the last but one paragraph of the report of Sri Gerajani."

In introducing any improved technique, involving a variety of factors, such as soil, climate and other conditions peculiar to different paddy-growing tracts, it was obvious that care had to be taken before recommendations were made. Furthermore, the Indian cultivator has to get the maximum out of a small patch of land and before he adopts any new method, he has to be convinced fully of its extra efficiency.

Spurred by the letter sent by the President of India on October 26, 1952, the Union Ministry of Food and Agriculture hastened the pace of collection of the data on the new method of paddy cultivation.

The President of India had written :

"Many thanks for your letter dated the 19th October, 1952, regarding experiments with Japanese Method of Rice cultivation. I shall await further developments with interest,

"In the meantime may I make a suggestion ? I believe experiments of various kinds for increasing yield of the more important crops are being carried out at agricultural farms (private as well as Government) and research institutions. I am not sure if these various institutions are keeping themselves in touch with the work being done elsewhere, and whether they are taking advantage of even

tentative findings of one another for the purpose of testing the results in the peculiar conditions prevailing in the area where the particular institution is working. For example, it is quite possible that the Japanese Method may be found suitable in Bombay, but not in Bihar and Orissa or *vice versa*. It would be desirable, if it is not being done now, to have some system of co-ordination of their work so that results of successful experiments may, more or less, simultaneously be available for large-scale application."

Enthusiastic interest regarding the new method became evident in the various State institutions and among research workers following the lead given by the Union Ministry of Food and Agriculture. The authorities of Kora Kendra and Bombay Government Kosbad Farm had, in the meantime, worked on the economics of the new method as practised by local cultivators. The Agronomy and Soil Sciences Committee of the Indian Council of Agricultural Research appointed a sub-committee to prepare a review of the proposed work on the economic use of manures, including fertilisers, and their adoption in suitable cultural practices.

The steps taken by the Union Ministry of Food and Agriculture, which later led imperceptibly to a revolution in paddy cultivation in India, were conveyed to the President of India in the letter sent by the Union Minister for Agriculture, Dr. Panjabrao Deshmukh, on November 18, 1952, which read:

"Kindly refer to your letter dated the 26th October, 1952. The Scientific Committee of the Indian Council of Agricultural Research keep themselves fully informed of the experiments being carried out in the country for increasing crop yields, and the latest information relating to these experiments is usually made available to the representatives of the committees. Recently, the Agronomy and Soil Sciences Committee of the Indian Council of Agricultural Research have appointed a sub-committee for preparing a review of the past work on the economic utilisation of both organic and inorganic manures and the adoption of suitable cultural methods for crop production. This review will enable the sub-committee to prepare a plan of co-ordinated experiments to be undertaken in the country, and also to bring to the notice of agricultural workers in the States the results of successful experiments on

cultural and manurial practices in increasing crop production. This will, of course, not touch the bigger and more vital problem of dissemination of useful agricultural information to the farmers themselves. I have been very conscious of this gap in our organisation both here and at the State end. I have just returned from a conference at Lucknow, where arrangements were discussed to tackle this in a big way and I am hopeful of progress soon."

As is the case with all new ideas, the concept that the Japanese Method of Paddy Cultivation will prove beneficial to the country had also its critics. And it was in the midst of the great debate in the country around the topic of suitability or otherwise of the new method that there came, suddenly, a gentle warning demanding concerted action from Pandit Jawaharlal Nehru, Prime Minister of India. The Prime Minister, in a note sent to Sri Rafi Ahmed Kidwai, Union Minister of Food and Agriculture, on December 22, 1952, remarked:

"Your attention must have been drawn to the improved methods of rice cultivation which have been adopted in many parts of Bombay State. These are after the Japanese pattern. It seems to me that this is a revolutionary approach which will yield very great results. It surprises me that, in spite of the success of this experiment in Bombay State, enough attention has not been given to it. I have referred to this matter in my fortnightly letter today. I would particularly draw your attention to it.

"I gather that some kind of a delegation is being sent by your Ministry to America to study agricultural methods. It seems to me that it would be far more useful for this delegation to go to Japan and learn about this food cultivation than to visit America or some country, where conditions are very different from those in India.

"I am sending you a note on rice cultivation which was given to me a few days ago."

CHAPTER II

PRELIMINARY PLANS

While the challenge of the new idea shook Indian paddy cultivators into a warmth of enthusiasm, there was evidently a surging receptiveness to understand the details of the new technique to raise paddy yields. This perceptibly overt reaction was met by Dr. Punjabrao Deshmukh, Union Minister for Agriculture, in a broadcast to the nation, on January 10, 1953, explaining the salient features of the Japanese Method of Paddy Cultivation.

"Of late" (said Dr. Deshmukh in his broadcast appeal) "considerable interest has been evinced by the general public in the Japanese Method of Rice Cultivation whereby, it is reported, over 6,000 lbs. of paddy was obtained last year at the Agricultural School Farm at Kosbad, in Bombay State. Similar high yields have been obtained at the Kora Gramodyog Kendra at Borivili, near Bombay. The Gandhi National Memorial Trust and the Kasturba National Memorial Trust, having been impressed by the very encouraging results obtained by the Japanese method of cultivation, have set apart a sum of Rs. 9 lakhs for the popularisation and propagation of this system.

"The rice farmers throughout the country will no doubt be interested to know the main features of this system of cultivation. In Japan, where the fertility of land on which paddy is grown, is now very high, the farmers get twice or thrice as much as our normal yields because of following a system of cultivation which is highly systematic and which involves the addition of adequate organic manures, application of fertilisers at proper time and at the proper stage of the growth of the crop and the labour that the farmers put in by way of interculturing and weeding. The main features of the Japanese method of cultivation may be described as follows :

"After the harvest of the paddy crop, the nursery area is ploughed when there is still some moisture in the soil.

If ploughing is not possible, the land is dug up and clods broken to pulverise the soil. The ploughing is usually done to a depth of three to four inches. The plot is well weeded and farmyard manure at the rate of one cartload, that is, about half a ton per 1/40th of an acre is added, and well mixed into the soil. The seed beds are preferably four feet in breadth and of any convenient length. The bed is raised two to three inches above the field-level and a space of about one foot between two beds is left in order to facilitate inter-culturing of the seed-beds and also drainage of water from the beds. A bed prepared in this manner will promote the growth of paddy seedlings in a loose and pulverised soil.

"On the top of the seed bed, compost is applied about an eighth of an inch in thickness. It is preferable to sieve the compost before applying it to the bed. The compost will encourage the roots of seedlings to remain in top soil, thus facilitating easy pulling out for transplantation. Over the layer of compost a thin layer of ash is spread. Ash is necessary for the good growth of seedlings. At sowing, seed is mixed with manure mixture in the proportion of one to two. The seed-rate adopted in Japan is five to six lbs per acre, sown in 1/40th to 1/27th of an acre of the bed. Great stress is laid on thinner seeding to get sturdier seedlings for transplanting. The seed is sown either in lines or broadcast.

"After sowing, the seed is covered with a thin layer of soil. In Japan, great care is exercised in selecting the seed for sowing. Sieved seed is put in a bucket of water to which salt has been added and heavy, well-filled seed which sinks to the bottom alone is taken for sowing.

"The Japanese farmer soaks the seed in water for a period of 7 to 14 days before sowing. Generally, slightly germinated seed, when sown, gives better results as the stand of the resulting seedlings is more uniform.

"Since the land in the nursery has been well prepared for sowing, the menace of weeds would be considerably reduced. Weeding, however, would be necessary, and this should be done once or twice during the period of the growth of the seedlings in the seed bed. After the first weeding, a dose of manure, equal to that given at sowing, is to be applied. If the growth of the plant is not very vigorous after manuring, one more dose of such a manure

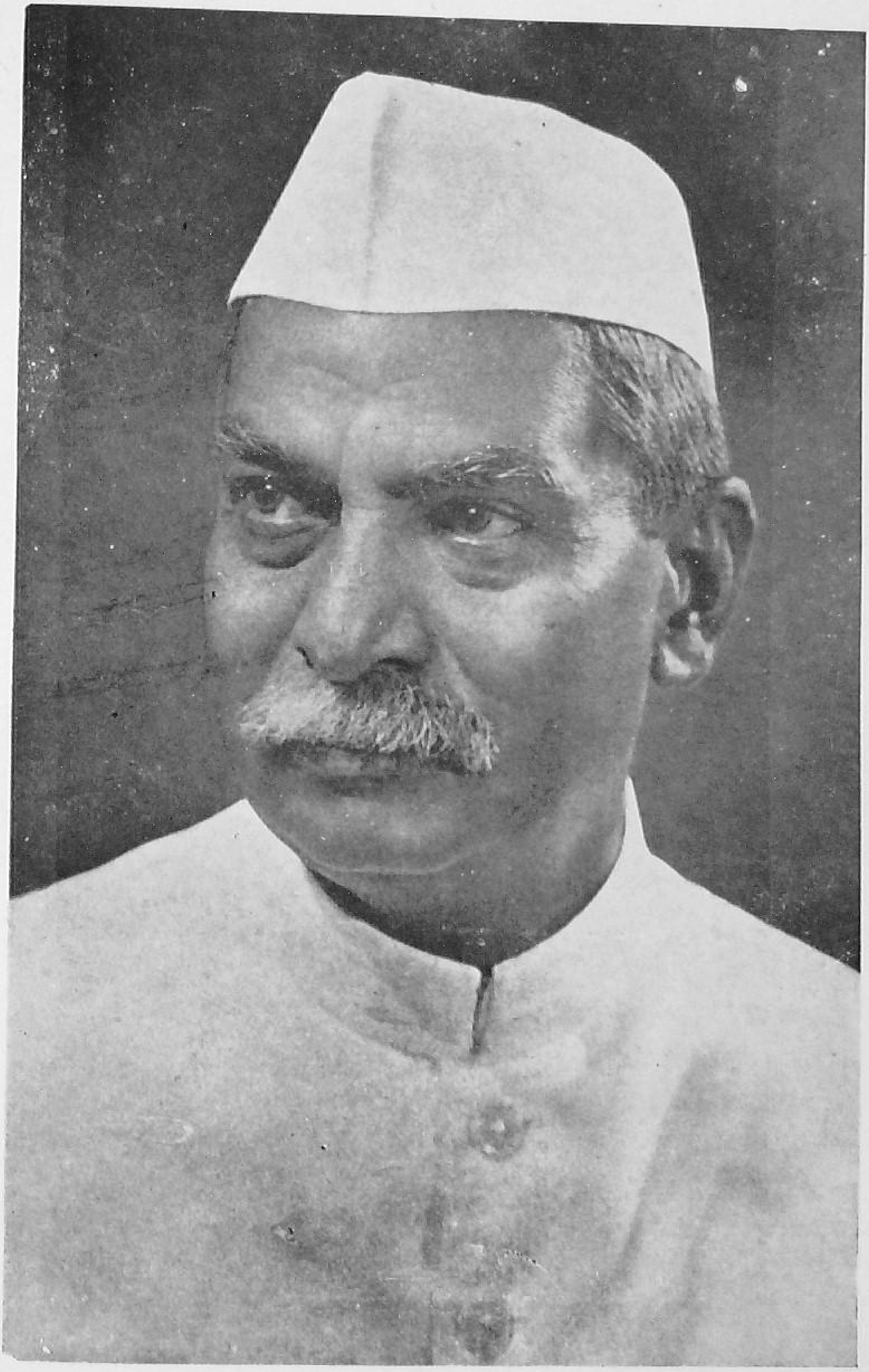
can be given to give the necessary stimulus to the seedlings.

"The field is properly prepared by frequent ploughings and the sides of bunds are properly prepared and well-framed. Sufficient attention should be paid to the repair of the bunds as broken and loose bunds provide a refuge for rats and crabs which destroy the seedlings. When uprooting seedlings, care should be taken to see that the root system is in no way injured. This can be done efficiently with the hand or with a hand hoe.

"The Japanese usually green manure their paddy fields with soyabean or Chinese wetch. After the green manure crop has been cut and dried for three or four days, it is ploughed into the field and well mixed. The quantity of green manure crop applied to an acre of land varies from four to seven tons. Generally, green manure crops are buried in the field about three months before the transplanting of rice.

"Before planting in the main field, a rope marked every 10 inches with a red thread will be handy for marking the rows for planting. Similarly, another such rope with the marks at every four inches or six inches will be convenient for spacing out the hills. The spacing between two hills will ordinarily depend upon the nature of the soil, the variety of paddy grown, etc. Planting in lines has been particularly stressed in the Japanese method because it has got many advantages to give to the farmer. The farmer can move freely in the field planted in this way and greater care of the crop is thus possible. The rows are usually eight to twelve inches apart, while the distance between the hills in the row is between three to eight inches.

"In Japan, the operation of transplantation of rice is done almost with a religious fervour, and the first day of transplanting is considered an auspicious day when the housewife puts on ceremonial clothes to mark the occasion. At this time, the schools are closed in order to allow the children to give a helping hand to their parents in transplanting work. Every Japanese boy or girl is made to feel that it is his or her primary duty to help his or her parents or neighbours in the work of transplanting paddy in the fields.



Dr. Rajendra Prasad, President of India

"In Japan, seedlings are held between the fore and middle fingers on the one side and the thumb on the other, and the plant is inserted straight into the soil without causing any damage. Planted this way, the seedlings get a good start in life and quickly put out full growth.

"Generally, 3 to 6 seedlings are planted per hill. Thin planting not only results in the saving of seedlings per acre but also provides better conditions for the growth of plants. The tendency of the Japanese farmer is to plant a lesser number of seedlings per bunch and allow them to grow freely and produce more tillers.

"The manure to be applied for the paddy crop is in the form of a mixture containing 70 to 90 lbs. of Nitrogen (350 lbs. to 450 lbs of Sulphate of Ammonia); 70 to 90 lbs. of Phosphoric acid (390 lbs. to 500 lbs. of Superphosphate); and 60 to 80 lbs. of Potash (120 lbs. to 160 lbs. of Sulphate of Potash) per acre. Half of the dose is applied at the time of puddling the soil, and the remaining afterwards. Inter-culturing of paddy crops is an important operation. The operation of weeding is combined with that of loosening the soil round about the plant and the weeds are buried in the soil. This aerates the roots of the seedlings and encourages tillering. It also checks the vegetative growth of the plant.

"The first interculturing is done 15 days after transplanting. Three or four more interculturings are given at intervals of 15 days. This work is discontinued when the plants are fully grown and commence flowering Very good results are obtained if at the time of inter-culture, manures like Sulphate of Ammonia, Superphosphate, compost, etc., are also applied. Another added advantage of such application is that there are lesser chances of fertilisers being washed away with the flowing water. For proper incorporation of manure into the soil, it should be first applied and the stirring of the soil round the roots of the plants done next.

"The Japanese farmer always keeps some seedlings in reserve for filling up the gaps in the fields as and when they occur. This practice is very desirable as it ensures a uniform stand of the crop and full yield.

"The system of irrigating rice fields is well-developed in Japan. Rainfall is experienced practically throughout

the year, and more than 90 per cent. of the paddy area in Japan has adequate irrigation facilities. Fields are usually dried for weeding or top-dressing of the plant with fertilisers.

"The method followed by the Japanese farmer of supporting lodged plants in the field to prevent the earheads from getting steeped in the water, and thus getting decomposed and lost by planting sticks in the field at a height of two feet from the ground at regular places, tying a rope to them and having such ropes every five feet and parallel to one another and resting the row of lodged plants on those ropes, is highly recommended. This method gives efficient results in times of untimely and heavy rainfall.

"By following the method of cultivation just described it is posible to obtain large yields of paddy. For instance, in the Thana district, Bombay State, where the Japanese Method of Cultivation has recently been tried, it is claimed that 8,000 lbs. of paddy per acre were obtained as against the normal yield of about 1,000 lbs. or so per acre.

"The Japanese method of rice cultivation does not involve any costly foreign equipment and can be followed by any industrious farmer. The secret of success lies in the farmer raising thrifty rice seedling for transplanting, adding adequate organic manures and fertilisers to the field and taking care in the preparation of the land for transplanting. Interculturing and weeding also play a very great part in the success of this method.

"Under the Japanese system of cultivation the paddy field is heavily manured, It will not be difficult for the Indian farmer to produce adequate quantities of compost, farmyard manure and green manure to meet his essential requirements. With the establishment of the fertilisers factory at Sindri, his requirements in respect of Sulphate of Ammonia can also be met, in part. Our position regarding the supply of fertilisers has now considerably improved, and if lack of purchasing power stands in the way of farmers adopting the Japanese system rice of cultivation, it should not be difficult for the Government, under certain conditions, to arrange for supply, on loan, of the required quantities of fertilisers.

"The system of cultivation, which produces high yields, naturally involves heavy manuring of the crops and some

more labour. But there is no doubt that all this is mostly amply rewarded. I, therefore, hope that in view of the serious shortage of rice in the country, all State Governments, co-operative organisations, and other public bodies and workers lend us a helping hand in achieving as large a measure of success as possible.

"The Indian Council of Agricultural Research should be glad to furnish any further information on this subject required by interested farmers."

Both in the Union Ministry of Agriculture and in the State Departments of Agriculture, preliminary plans for introducing the Japanese Method of Paddy Cultivation went apace during January, 1953.

Immediately after his broadcast on January 10, 1953, Dr. Panjabrao Deshmukh visited West Bengal and the Damodar Valley Corporation from January 12 to 16, 1953.

On his return to New Delhi, he convened a meeting of the technical advisers and other officers of the Union Ministry of Agriculture (January 20, 1953) for a full discussion on the Japanese method with some of the workers of the Kora Kendra, who were specially invited to acquaint the meeting with their experiments and experiences. Details of what transpired between January 10 and 22, 1953, were conveyed by Dr. Panjabrao Deshmukh, Union Minister for Agriculture, to the Prime Minister of India on January 22, 1953, in the following words :

"I regret these papers* reached me only on my return from tour on the afternoon of the 16th January. My attention to the note on rice cultivation was, however drawn some time back, as a result of which I sent a cable to Sri Damle in America, directing that on their way back to India they should visit Japan and study the Japanese Method of Paddy Cultivation. In fact, detailed instructions as suggested in the penultimate paragraph of that note were issued to Damle. In paragraph 2 of P.M.'s note there is a reference to a delegation visiting America. I think it was this delegation which Damle took to America with 21 other agricultural extension officers for studying the American system of extension

* A reference is here made to the Prime Minister's note of December 22 to Sri Rafi Ahmed Kidwai. Please see Chapter 1, page 7.

that was meant. The delegation, accordingly, visited Japan and studied the matter.

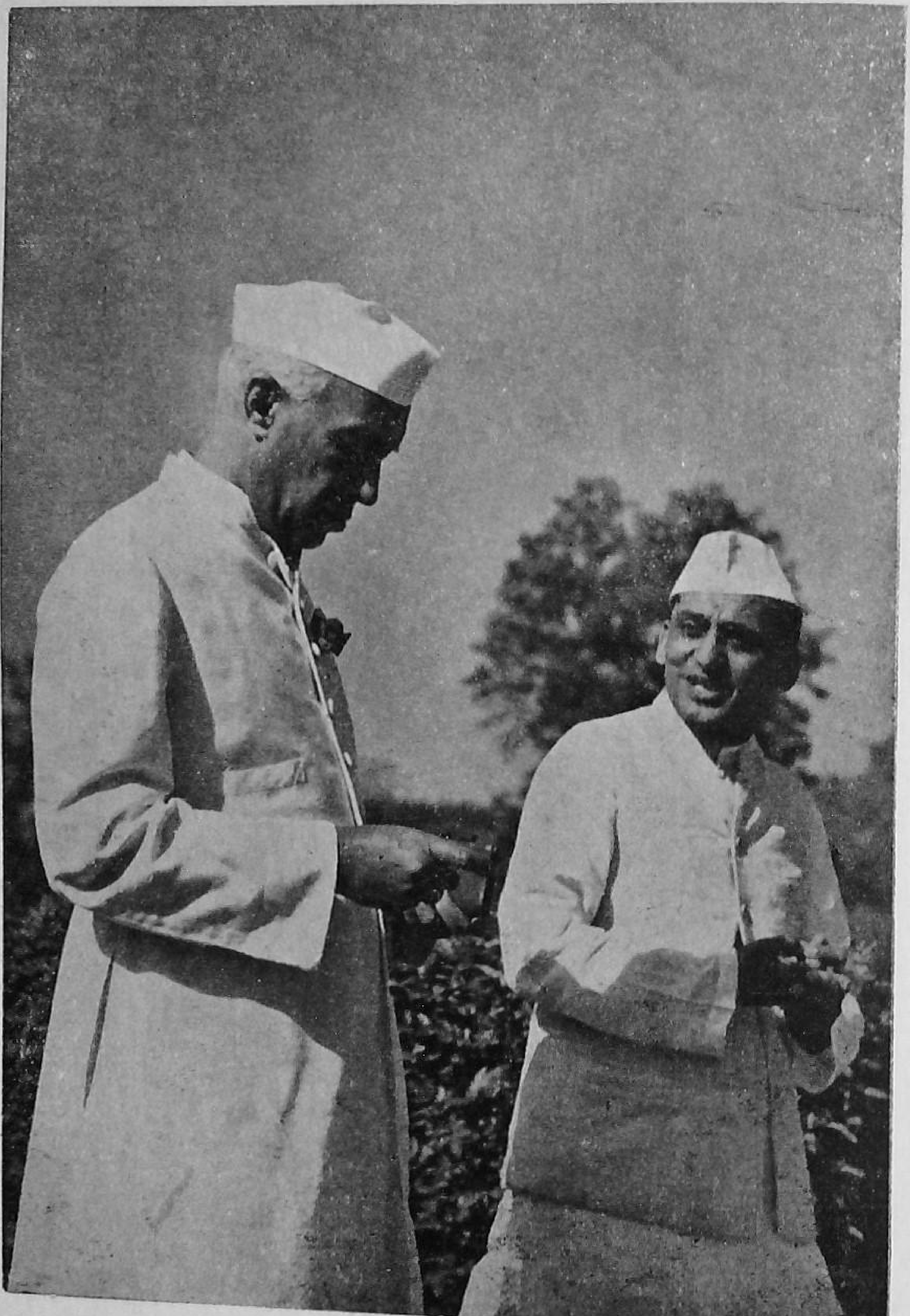
"I had some correspondence on the subject with the President. Copies of that correspondence are attached herewith for perusal. I had also taken the earliest opportunity of visiting the Kora Kendra and have studied with great care all that they are doing there. The Agricultural Commissioner, who was lately Director of Agriculture in Bombay and was well acquainted with this method, was asked to collect the available data and research findings. The report this officer gave convinced me further about the potentialities of this method.

"While the above facts will show that I and my Ministry had been fully attracted by the Japanese Method of Rice Cultivation, I confess we had not taken it up with the seriousness and urgency it deserved. The Prime Minister's chastisement at the Food Conference on the 8th instant was, therefore, well-deserved. This had the necessary effect of stirring us to quicker and greater action. Since that date I have taken the following steps :—

'On the 10th January at 8-30 p. m. I broadcast from All-India Radio a talk on the Japanese Method of Cultivation. This was followed by a translation in Hindi. I believe it was put out from A. I. R. stations in the various Indian languages. The papers gave the broadcast wide publicity.

'During my visit to West Bengal and Damodar Valley Corporation between the 12th and the 16th January, I discussed with the various Ministers of West Bengal and other important officials what the West Bengal Government could do in this connection. I am glad to say that they were very enthusiastic and promised to do their best in implementing our suggestions. Apart from the publicity and propaganda, the programme they proposed to undertake is to have over 2,000 demonstration plots all over West Bengal. They have also agreed to arrange for the distribution of fertilisers as far as possible at the door of the cultivator. For this purpose co-operative societies and all other agencies would be utilised.

'The West Bengal Government has now accepted a target of 50,000 tons of Sulphate of Ammonia, which is three times that of the last year, on our promising



Shri Jawaharlal Nehru, Prime Minister of India, and Shri P.S. Kapadia, one of the Pioneers of the Japanese Method of paddy cultivation in India.

to give them the necessary credit facilities. Arrangements are also being made to enthuse school and college boys and girls, teachers and professors etc. so as to carry the information to the cultivator and help them with manual labour. This should be easily possible, at least at the time of transplanting as well as harvesting. But possibilities of help at other stages of agricultural operations would also be considered. I hope to rope in the Department of Education as well as the educationists and other sections of the society, who may be interested in rural welfare work. The Education Secretary to the West Bengal Government promised all help.

'On the 20th January I called some of the workers of the Gandhi Smarak Nidhi from the Kora Kendra and along with our agricultural experts had a detailed discussion. A definite and an agreed programme to popularise and propagate the new method has already been chalked out for immediate implementation. The main features of this programme are as follows:—

(i) arrange in co-operation with State Governments, the Gandhi Smarak Nidhi and other workers a campaign of demonstration, propaganda and publicity;

(ii) pamphlets for workers and for farmers will be prepared in the various languages of the country and in a style which would interest them;

(iii) film-strips and posters will be prepared. These would be distributed on a very extensive scale throughout the length and breadth of the country so as to arouse interest in as many areas as possible;

(iv) fairs and melas would be utilised;

(v) arrangements for training by workers of the Gandhi Smarak Nidhi and the State Government experts and officials are being arranged;

(vi) organise visits of farmers to the centres of demonstration, including Kora Kendra.

'In short, all possible extension workers, government officials, non-officials, and community projects will be brought in as far as they can be through appeals, talks and propaganda. Material in simple form will be made available

on a wide scale for a general understanding of what is involved in increased production of rice.

'As regards increased use of fertilisers, I have already taken steps to distribute nearly two hundred thousand tons over and above what the States held already which is more than 1.50 lakh tons. And this figure will go up considerably when I have completed arrangements with the rest of the rice-growing States, which I propose to do by personal contacts and visits to States. This itself ought to give us some 400,000 tons more of rice in the coming season. Arrangements are also proposed to be made for a drive for the utilisation of simple implements such as those used in Japan and for better utilisation of farm-waste and night-soil.

'I propose, if I may, to keep you informed about the progress of this work and to have your advice and guidance from time to time."

The Prime Minister of India in a Note dated January 22, 1953, expressed his satisfaction over the steps taken by the Union Minister for Agriculture for initiating the campaign, and wrote:

"I am glad to note the energy and enthusiasm shown by the Minister for Agriculture in this matter.

"I suggest that the Agriculture Ministry might produce a small pamphlet on this subject. I shall have it sent to Congress Committees, etc."

At a meeting held on the January 20, 1953, the Agricultural Extension Commissioner was asked to take charge of the campaign and the Ministry of Food and Agriculture made the Indian Council of Agricultural Research responsible for its promotion. Original plans were proposed for the promotion of a mass campaign, which for the first time visualised a well-directed plan, using new and simple but effective methods.

The imaginative and bold conception inspired by the drive and energy of the Minister and the Secretary of the Union Ministry of Agriculture made it possible to use such media as flip-books and flannelgraphs, for the first time. Nowhere in the world have such media been used before for such a country-wide campaign.

It was necessary, between January 20 and March 15, 1953—the latter, the target date on which the campaign was to be launched—to get the outlines of the campaign finalised in general terms and in terms of conditions, in consultation with the State Agricultural authorities, and to turn these into simple promotional material and visual aids for use by field workers and printed in a number of local languages for mass distribution. There was, in addition, the much more important problem of ascertaining supply requirements; of organising supply-lines to reach far down to the villages, in all the States, where the campaign was to be implemented at the field supply depots; improved varieties of seeds, implements, plant protection materials, etc., had to be in place ready for the campaign.

It was the first time in the history of the Union Ministry of Agriculture that a campaign of this magnitude was undertaken. Support came from the Vice-President and Secretary of the Indian Council of Agricultural Research, as well as magnificent co-operation from the States, Kora Kendra and other selfless workers in rural areas. Considerable thought had gone into planning this campaign which necessitated, for the first time, a co-ordinated approach at all levels and a well-knit theme running through different media. It was realised that as the paddy-sowing season lay only two months ahead, advantage had to be taken of the ensuing interval for planning field demonstrations and making available to field workers promotional material to help them in their task of getting a wide acceptance of the idea by farmers.

To maintain the tempo of the campaign, the Union Minister for Agriculture, Dr. Panjabrao Deshmukh, addressed a letter to the State Ministers for Agriculture on January 24, 1954.

The letter read:

"As you are aware, the Kora Gramodyog Kendra, Bombay, have for some time been experimenting on the Japanese method of rice cultivation, the main features of which are—

(1) Raised nurseries for seedlings;

(2) A low seed-rate for the nursery;

(3) Very heavy manuring of the crop, both in the nursery and in the field;

(4) Transplantation of fewer seedlings per bunch;
(5) Transplantation in rows; and
(6) Adequate interculture in the fields and proper weeding.

"It will be seen that some of these features are applicable universally, while the others, like seed-rate or the nature and quantity of manure to be applied, can be adjusted to suit different areas, such modifications being based on research results and the experience of the Department of Agriculture.

"The experiments at Kora Kendra gave favourable results and the method was also tried on an extensive scale and appeared very promising. The Gandhi Smarak Nidhi has made a handsome grant to the Kora Kendra for the promotion of this method in the rice-growing tracts of India. The President and the Prime Minister are keen that this method may be adopted with suitable local adjustments on a large scale. In my recent broadcast from All-India Radio, New Delhi, on January 10, 1953, I have given full details of the method, and had appealed to State Governments, co-operative organisations, public bodies, official and non-official workers and others to lend a hand in achieving a substantial rise in rice production by universal adoption, wherever possible, of the beneficial features of this method in the coming kharif season.

"Encouraged by the response to this broadcast, I recently called a meeting in New Delhi on January 20, 1953, to consider the ways and means of starting a country-wide campaign for the promotion of this method, so that in the next paddy-sowing season, large areas in the States may adopt it with necessary adjustments to its local conditions with the ultimate end that there may be abundant additional rice production in the country.

"After careful consideration the meeting decided that the following steps be taken immediately:—

"1. The campaign should start simultaneously all over the country on March 15, 1953, when the Union Minister for Agriculture would request the Prime Minister and all the State Ministers to open a campaign by broadcast talks from different centres of All-India Radio.

"2. By that date all the campaign material must be available to the workers of the campaign in the States

for large-scale propaganda. This material would consist of :—

(a) detailed pamphlets giving fullest description of the new method for use of the Agricultural workers ;

(b) small circulars in simple language outlining each step in the new method through drawings, wherever possible ;

(c) posters ;

(d) film-strips etc.'

"All these will be included in one promotion packet which will be with each person engaged in the propaganda, and who will be given full directions as to how to use them.

"The States should be addressed to make the necessary arrangements well in advance for the supply of fertilisers required by the farmers who, as a result of this campaign, adopt this method.

"The State Directors of Agriculture should immediately prepare small technical leaflets based on the general principles of the Japanese method, with suitable adjustments regarding quantities of seed and manure in the light of their own experience. These should be written in simple language and should be available to the Ministry's Information Section immediately so that adequate numbers can be printed and made available.

"Wherever possible, good farmers in a locality may be chosen, and they may be persuaded to plant adequate number of nurseries so that distribution of seedlings roundabout may be possible. If necessary, prizes may be offered to such farmers for the best nurseries.

"Wherever rich organic manure like sludge, tank silt etc. are available, these should be utilised by diverting them to paddy growers.

"Holidays be declared in the transplanting season to enable teachers and children in large numbers to assist transplanting operations so that this can be completed within the shortest time available. Similar holidays at intervals may be worthwhile to ensure association with farmers and completion of measures like weeding and so on. This kind of participation should be a regular feature

on two or three week-ends consisting of Friday, Saturday and Sunday.

"An organisation should immediately be set up in the State to take the full responsibility for promoting the campaign by propaganda, and for ensuring that the necessary supplies and materials are available in time in right quantities to the farmers who adopt the method, and that they are constantly assisted throughout the growing season with the necessary information on technique, in the matter of supplies and in general for the success of the campaign.

"The Secretary, Agriculture Department, and the Director of Agriculture in your State are being separately addressed to organise the campaign on the above lines, to fix resposibility for the success of the campaign and to provide immediately the schedules in English and in local languages giving the technique of the Japanese method to form the basis of guidance to farmers. These will then be reproduced in thousands for distribution through promotion packets. They are also being requested to finalise a detailed plan of action for the success of the campaign and to execute the plan with clock-work precision.

"I now request you to kindly lead this campaign in your State, give necessary instructions to the Agriculture Department and the Directorate of Agriculture so that all are ready under your leadership to do the utmost propaganda for the object in view and its successful realisation. I repeat again that the President and the Prime Minister are most keen that thousands of farmers in the paddy-growing areas may benefit by adopting the advantages in this method in the coming season; that they are given the necessary techniques to practise the method, and are assisted at all stages with information, supplies and materials to enable them to make a success, on a very large scale, of the techniques which the campaign requires them to adopt. I am confident that under your leadership an organisation consisting of a high-level committee of action will be set up immediately, the matter will be given the highest priority, the necessary psychological atmosphere will be built up for the promotion of the campaign which will start formally with your leading broadcast on March 15, 1953, and at the same time a well-thought-out plan for propagating the method in the State and for meeting its requirements will be finalised and implemented.

"Meanwhile, between now and March 15, 1953, the utmost propaganda may be made by all agricultural staff through radio, press, leaflets and all other means, and through official and non-official channels that may be readily available, to stress the following items :—

(1) Importance of preparation of land by adequate ploughing, etc.

(2) Taking steps to collect fertilisers and manures, prepare compost and arrange for green manure seed.

(3) Initiate a drive for collection of bones and find out if the Bombay-manufactured bone-digester could be utilised in selected places.

(4) Collect improved seed and sort it properly and treat it as required.

(5) Importance of bunding and the repairing of existing bunds.

(6) Proper preparation of seed-beds.

(7) Proper method of transplanting and ideal spacing.

(8) Importance of interculture.

"I request you to keep me personally informed both of the progress made and any assistance you may need. I would be grateful for any suggestion you may like to make. I am happy to say the proposal appears to be catching public imagination, if the number of queries and requests for information that are pouring in is any guide.

"I have no doubt you and your Government will agree with me in giving this matter the highest possible priority and all your energies in doing your utmost to further the scheme.

"I do not wish to talk aloud of achieving self-sufficiency or to mention big targets. Let us strive our utmost sincerely, ceaselessly and earnestly and leave the rest to Providence. If the Burmese can achieve an average of more than two-and-a-half times that of India, I do not see why we should not achieve the same at least on 20 per cent. of our land. Whether we succeed to the fullest extent or not, I have no doubt the thing is worth attempt-

ing, and even if we achieve partial success, we would have contributed to our betterment at least in some measure."

The first broadcast from All-India Radio on the Japanese Method of Paddy Cultivation by the Union Minister of Agriculture on the January 10, 1953, in turn, led to thousands of enquiries from cultivators, enthused to know more about the new technique of growing rice. The great interest evinced by the nation prompted the Union Minister for Agriculture to broadcast another appeal on January 29, 1953.

In his broadcast to the nation, Dr. Panjabrao Deshmukh said :—

"The recent broadcast on the Japanese Method of Rice Production has aroused considerable interest in the country and literally thousands of enquiries have been received about the details of this method. Encourged by this response, we have decided to direct a nation-wide effort upon the adoption of this method, and at the same time, we are aiming at a concentrated advance in getting the details of this knowledge to our cultivators. We are hoping to carry within the next 45 days, the technique of increased rice production to 2,25,000 villages in the country, *i.e.* before the next paddy growing season, so that it may be adopted with suitable adjustments in large areas in the rice-growing States. Thus we are hoping to achieve by the end of the year a higher level of rice production than ever before.

"Our soil and climate, the ability of individual cultivators to produce over 12,000 lbs. of paddy an acre, as two farmers from South India have proved during 1951 and 1952, and our vast population, the majority of whom are rice eaters—all point to paddy as the sheet anchor of our agriculture.

"The time has, therefore, come for us to adopt the methods of our efficient Japanese friends on a larger scale in our country. It is clear that increasing the yield of paddy is no mysterious process. It can be achieved by the use of improved seed, proper planting and cultural methods and by the judicious application of fertilisers and manures. While experts can continue their researches into the cost and improvements of what has now come to be known as the Japanese method, sufficient knowledge is available which is capable of immediate application. I

wish to tell you very briefly the steps that we have taken since I spoke to you last in implementing our decision.

"A nation-wide campaign will be launched on March 15, in which I am hoping that not only will officials sand non-officials will join wholeheartedly but also thousands of our students in our schools and colleges. We want complete information on the method and the arrangements we have made to reach the farmers' fields so that they can immediately put them into practice. Arrangements have been completed for the widest possible distribution, in the rice growing tracts, of leaflets and small pamphlets, which will be models of simple statement and concise guidance.

"I am hoping that within the next three or four weeks, this literature written in local languages will be in the hands of village teachers, school children, members of the public and as many literate people as possible, so that they may all help in carrying this message of increased rice production to the largest possible number of cultivators of rice, I am approaching State Governments to declare holidays at the time of transplantation of the seedlings, so that thousands of students and their teachers may help to grow two blades of rice where only one grew before. Participation in a national endeavour of this kind is a feature of Japanese paddy cultivation. What Japan has done, surely India can also do.

"The mere distribution of literature will not help us because unfortunately an overwhelming percentage of our cultivators are illiterate. We are, therefore, pressing into service all publicity media. Leaflets. lectures. films, written advice and broadcast talks are all good in their own way but ultimately the cultivator, like all other realists, finds it easiest to educate himself through his own eyes. He wants to see the job done and its results. An essential feature of our programme, therefore, is to lay down in all rice-growing States demonstration plots. During my recent visit to West Bengal, I was heartened to learn that the State Government has already planned to have over 2,000 such plots all over the State. Each of these demonstration centres will be a radiating centre for this improved technique of rice production.

"This leads me to the next subject of fertilisers, which play a very important part in the Japanese method. One

of its essential features is heavy manuring of the crop both in the seed-bed and in the field. Sulphate of ammonia is the fertiliser we are relying upon to increase our rice yield. It will give that extra 5 or 10 per cent in yield that will add up to the saving of crores of rupees which we now spend on foreign imports. Making available manure at the proper time and in the required quantities has been exercising my mind during these last few days, and I am glad we have worked out a satisfactory scheme. To-day, there is more fertilizer available for our cultivators than at any other time in our history and the Government is in a position to distribute it to the cultivators on the basis of deferred payment.

"It has, therefore, been decided that short-term loans should be granted in the form of fertilisers, either for straight application or as mixtures to enable an extensive application of the fertiliser to irrigated paddy. Under this arrangement the cost of fertilisers will be recovered from the cultivators immediately after the harvest, and the loan repaid to the Government of India at the end of June the following year.

"I have already therefore taken steps to distribute nearly 200,000 tons of fertilisers over and above 1½ lakh tons already held by the States. I am expecting that this figure will go up considerably when I have had discussions with other rice-growing States, which I propose to do personally during the next few days. This itself should give us an additional 4 lakh tons more of rice in the coming season, which would mean a saving of nearly Rs. 34 crores of rupees for other nation-building activities.

"During my visit to West Bengal and the Damodar Valley Corporation last week, I had the benefit of discussions with various Ministers of West Bengal Government and other important officials, as to what they could do to help the country in this connection. Every one was bubbling over with enthusiasm, and I have their promise for doing their very best in implementing our suggestions. In addition to the 2,000 demonstration plots all over West Bengal, about which I have already spoken, the West Bengal Government has agreed to take fertilisers, as far as possible to the fields of the cultivators. For this purpose, cooperative societies and other agencies will be pressed into service. The State Government has accepted 50,000 tons of sulphate of ammonia which is three times the

qtantity they used last year. I was told that steps have been taken to infuse school and college-going boys, teachers and professors with enthusiasm, and they will carry the information to the cultivator and help him in his field.

"A week ago, I had the workers of the Gandhi Smarak Nidhi from the Kora Kendra for a discussion with our officers in Delhi. An agreed programme to propagate the new methods has been chalked out for immediate implementation. In addition to their co-operation in a campaign of demonstration and publicity, arrangements have been made for training workers by the Gandhi Smarak Nidhi and there will be organised visits by farmers to centres of demonstration including Kora Kendra.

"I shall be touring other rice-growing States during the period between now and the session of Parliament, to get the fullest co-operation of their Governments in this drive.

"I should like to take this opportunity of appealing to the State Governments to ensure the proper distribution of fertilisers to the cultivators in time. A suggestion has already been made that State Governments should select 10 workers for each district and entrust 10 villages to each of them for distribution of the information material, which will be reaching them shortly. It is hoped that with about 250 districts in India, 25,000 villages will have been covered in the first drive. If the workers could be increased nine times, 2.25,000 villages would have received the information material, and would have become acquainted with knowledge of the new method.

"May I repeat that there is nothing mysterious about the Japanese method of rice production In its fundamentals; it is merely better agriculture. All farmers know that for good crops the land must be ploughed as early as possible after the harvest and as often as possible. This is necessary because the lower layers of the soil have to be exposed to the rays of the sun. A good farmer knows the value of proper bunding of his fields. and the need for keeping the bunds in repair.

"It is an agricultural truism that the more the manure the greater the fertility of the soil and the larger its yields. Therefore, now is the time to set about the collection of all kinds of manure. Droppings of cattle, night-soil and every dry leaf should get into the compost pit, so that at

sowing time and after, larger quantities of organic manure are available. Bones make excellent manure and special efforts necessary to collect as many of them as possible.

"The best possible seed should be used for sowing. A simple test is to place the seeds in half a bucket of salt water and use only those which settle down at the bottom. The Japanese method, therefore, ensures a substantial saving of seed. Their method of sowing in lines not only helps seedlings, but also makes possible proper interculture. This too must be followed.

"In addition to all this, I propose to start a movement for the utilisation of simple agricultural implements similar to those used in Japan, and for the better utilisation of farm waste and night-soil.

"We have done all this but, of course, there is plenty more yet to be done. Unless we are able to enthuse every worker, Government or non-official, with the responsibility for co-operation in this gigantic task, increased production will elude our grasp. It is unthinkable that we should fail to take advantage of this opportunity to throw off the shackles of economic dependence on other countries.

"If our hopes blossom to fulfilment, Indian agriculture may look forward to an unending era of prosperity. There are, of course, likely to be ups and downs, for growing the nation's food is no light task even if we were not dealing with things as unpredictable as the ways of Nature. But it should be in our power to do away with all imports of foreign rice by the end of this year. This is not a Utopian dream ; it is the first stark necessity in our planning for a Free India."

CHAPTER III

MOUNTING OF THE CAMPAIGN

Concerted action by the Union and State Governments gave momentum to the streamlined campaign that was being evolved for the promotion of the Japanese Method of Paddy Cultivation.

On January 27, 1953, the Vice-President of the Indian Council of Agricultural Research addressed a circular letter to all the State Governments on the proposed country-wide campaign. The letter read :

"The shortage of rice has been the most difficult problem which is facing our Central and State Governments since long, and various methods have been tried from time to time and measures taken to encourage rice production in the country by extensive "Grow More Food" campaigns based on schedules and techniques of improved cultivation and manuring suited to the conditions in the rice-growing areas of this country. Of late, the method of intensive rice cultivation, which has got known as the Japanese method, and which the Kora Gramodyog Kendra of the Bombay Suburban District Village Industries Association at Village Shimpavli, near Borivili, in the Bombay Suburban District, have been carrying on for the last few years, has aroused considerable interest in the minds of the general public in as much as it is reported that over 6,000 lbs. of paddy was obtained last year at the Agricultural School Farm at Kosbad by this method. Similar high yields have also been obtained at other places in the Bombay State, where these experiments have been conducted.

"The main features of this method are : (i) Raised nurseries for seedlings ; (ii) A low seed-rate for the nursery ; (iii) Very heavy manuring of the crop, both in the nursery and in the fields ; and (iv) Transplantation of few seedings per bunch and adequate interculture in the fields and proper weeding.

"The results obtained from the adoption of the method are so encouraging that the Government of India feel that while experts can go on finding further facts about the method and its cost and possible improvements, there are certain features in the method, *e.g.*, substantial saving in seed, method of preparing seedlings in nurseries, adequate manuring of nurseries and fields and line sowing which are distinctly advantageous and, therefore, with adjustments to suit local conditions, capable of immediate large-scale application. Accordingly, the Government of India have decided that a countrywide campaign should be started with effect from March 15, 1953, for the adoption of the method by the farmers on a large-scale. In order to achieve this objective, lucid and clearly written leaflets in the local languages should be made available to arouse mass enthusiasm for the method and that these should be in the hands of village teachers, school children, members of the public, officials and as many other agents as possible, so that they may carry the message as to how to increase rice production to as many paddy cultivators in the country as possible.

"Publicity material for the campaign will consist of pamphlets giving the general outlines of the method advocated, leaflets on the actual technique in the local languages prepared by the States' Directorates of Agriculture after modifying items of the Japanese method like seed-rate, manuring and the number of plants to be transplanted to suit local conditions; flannelgraphs, flipcards, film-strips and posters. All these will be made available to the States in "promotion packets" in large numbers for the workers who will take active part in the campaign. The Information Section of the Council will prepare the publicity literature and other material essential for the success of the campaign and will indicate how these are to be distributed and used.

"The most important factor on which the success of the method largely depends is heavy manuring, both in the field and in the nursery, so that healthy seedings are transplanted and thereafter these get adequate nutrition in the fields, resulting in bumper crops. Therefore, the question of making available adequate quantity of fertilisers and organic manures to the paddy-growers at the proper time is a very important matter, and steps should be taken immediately to ensure that proper arrangements are made for manures and fertilisers to reach the cultivators' fields

in adequate quantities at the time required. This will involve careful planning of the campaign centres, stocking of manures and fertilisers at these centres and their distribution. In so far as Ammonium Sulphate is conerned, it is available in adequate quantities. As regards superphosphate, the Government of India, Ministry of Food and Agriculture, are prepared to help State Governments in diverting the supply.

"It is considered that participation in the campaign of all who depend on farmers for their food is a sacred obligation. In particular, such participation is essential for operations like transplanting, weeding, etc. which farm people have to complete in a short time. Holidays should be observed in schools during such short periods, when farmers need extra hands so that teachers, children and others in thousands may go out to the fields and help farmers to complete quickly their field operations."

The Vice-President of the Indian Council of Agriculture Research listed the steps to be taken by the State Governments:—

"(i) The State Directorate of Agriculture should immediately prepare small technical leaflets based on the general principles of the Japanese method. with suitable adjustments regarding seed and manure in the light of their own experience. These should be written in simple local languages and should be sent to the Council's Information Section immediately, so that adequate numbers may be printed and made available to the States for wide distribution;

"(ii) Necessary arrangements may be made for the supply of fertilisers in adequate quantities to the farmers who agree to adopt this method;

"(iii) While Ammonium Sulphate is available in adequate quantities, the extra quantity of Superphosphate required may be intimated to the Union Ministery of Food and Agriculture, so that necessary arrangements for its supply may be made;

"(iv) Wherever rich organic manures like compost, tank silt and sludge is available, this should be utilised by diverting it to paddy-growers;

"(v) Wherever possible, good farmers in a locality may be persuaded to plant adequate number of nurseries

so that distribution of seedlings may be possible. If necessary, prizes may be offered to such farmers for the best nurseries;

"(vi) The possibility of declaring a few holidays in the schools during the transplanting season to enable teachers and children in large numbers to assist transplanting operations with a view to completing it within the short time available, may also be considered;

"(vii) An organisation should be set up in the States to take the full responsibility of promoting the campaign and of ensuring that necessary literature and fertilisers are made available to the farmers who adopt the method."

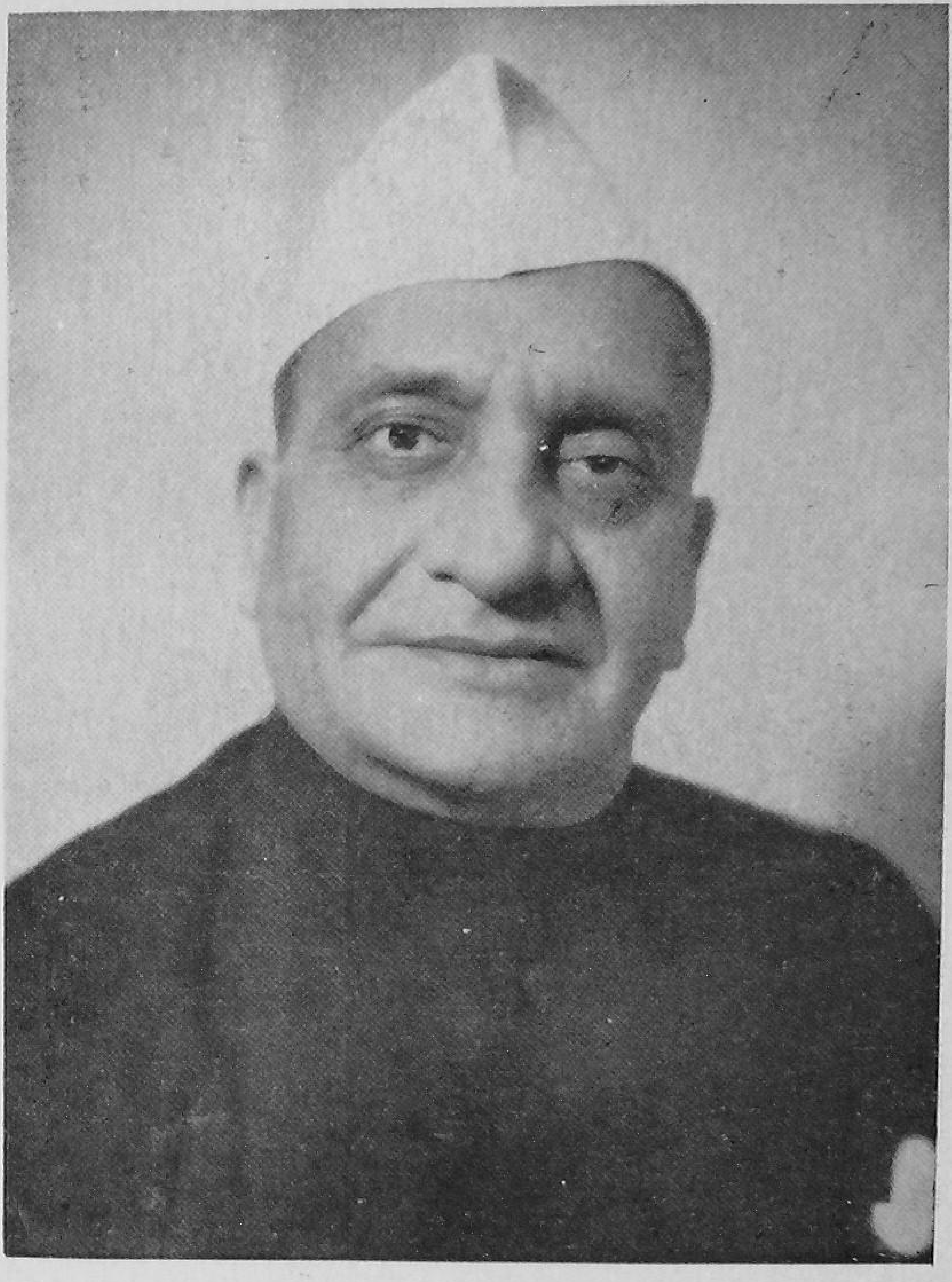
The State Governments were requested to implement the above decisions and to intimate the Union Ministry of Food and Agriculture of the action taken.

To keep the Prime Minister in close touch with the progress of the campaign and to have his able guidance from time to time, the Union Minister for Agriculture, Dr. Punjabrao Deshmukh, sent a Note to him on January 30, 1953.* The Note reviewed the progress actually made and the future plans aimed at. It said:

"Prime Minister may probably be interested to go over the figures of area under rice and the average production in the various States from year to year. The fluctuations are very great not only between a State and a State, but in many States from year to year. I place below two statements which give information in a tabular form.

I have not been speaking of a higher target than four lakh tons, because I do not wish to create an expectation which we may not be able to fulfil. Actually, of course, I believe that it should be possible for us to add to the total production of rice in India to a much larger extent. Viewed against the background of our total cultivation, the whole thing appears shockingly simple. We have at present over 76 million acres under rice, but our average yield is painfully low, being hardly 650 lbs. per acre, which means 8 maunds. Half a per cent of our total land under paddy would come to 3.80 lakh acres. The yield under the Japanese method is claimed to be 6,000 lbs. or nearly three tons per acre. If we, therefore, select even this very small area of half a per cent all over India and

* See Appendix for facsimilie of the Note.



Dr. Panjabrao S. Deshmukh, Union Minister for Agriculture

practise the Japanese method on it, we should get over 400,000 tons, even if the average yield in this area comes to only about 4,CC0 lbs. per acre.

"We are trying to utilise as much of Ammonium Sulphate for rice cultivation as possible. At the rate of one maund per acre it will benefit 1.19 crore acres. The minimum yield as a result of the addition of Ammonium Sulphate alone is calculated to be 2 maunds of rice per acre or 3 maunds of paddy. If we could couple this with some at least of the Japanese practices the yield should be very much more. Even if we deduct from this acreage 3.80 lakh acres, which I have taken up for fuller Japanese treatment, we should get not less than four lakh tons of rice in our hands, if we distribute Ammonium Sulphate on the basis of one maund of rice for one maund of Ammonium Sulphate. When we get this four lakh tons in our hands, there would be four lakh tons of additional rice in the hands of the cultivators.

"I have indulged in these figures only with a view to show that what we are aiming at is well within our reach.

"Incidentally, I may point out that there is one difficulty which is causing me much anxiety and which would have to be resolved at an early date. The cost of the Ammonium Sulphate per maund at the door of the agriculturists may be anything between Rs. 15 to Rs. 16. The price of rice per maund is equivalent or a little more than this only in a few States like Uttar Pradesh and Saurashtra. In other States, the prices are lower, although these prices have no comparison with the imported rice which is delivered at our ports for nothing less than Rs. 25 to Rs. 30 per maund. Since we have not as yet obtained sanction of the Finance Ministry, I have not committed myself to the proposal of agreeing to take a maund of rice in lieu of one maund of Ammonium Sulphate, wherever the agriculturist on the State Government chooses to do so.

"While both the State Governments as well as agriculturists of Uttar Pradesh and Saurashtra may be prepared to pay us the price, the other State Governments would be attracted by the proposal if we could ask for the return of the price of Ammonium sulphate in kind. Even in Uttar Pradesh and Saurashtra, Ammonium Sulphate is not likely to be very popular, unless we are in a position to reduce the price. This matter will, probably

come up to the Prime Minister through the Minister for Food and Agriculture, but the only submission I would like to make is that this matter should be decided at the earliest possible moment. The advantages—nay, even the financial gain we are likely to secure by the acceptance of my proposal--would be so substantial that I personally feel no sacrifice on our part would be too great or unwise.

"A fuller note would, I am sure, be submitted to the Cabinet through the Ministry of Finance soon. But as it is likely to be a great impediment in the working out and success of our programme, I have taken the opportunity of bringing this to the notice of the Prime Minister. Unless some early action is taken in this respect, our aim to distribute four-and-a-half tons of fertilisers would be very difficult of attainment, causing serious handicap to the Sindri factory, who, I learn, have already 60,000 tons on hand. Mr. Chandra told me only yesterday that after producing 10,000 tons more, they may be forced to close down the factory unless the stocks are physically lifted at once.

"Lastly, I would like to indicate the stages at which popular enthusiasm and readiness to render manual assistance could be utilised. They have already been stated in the draft pamphlet but I would like to summarise them here. The first stage at which students, teachers as well as non-official and official workers, could help us would be to preach and practise collection of manure of all kinds. This could be done by digging compost pits and assisting the cultivator as well as persuading him to collect every piece of cowdung, dry or green leaves, night-soil and bones. At the second stage, free assistance may be given to the cultivators in breaking clods of earth and the preparation of the soil. The third stage would be the construction or repair of bunds. The fourth would be transplantation; fifth, weeding; and sixth, harvesting.

"The pamphlet mentions that efforts would be made to give holidays to schools and colleges on certain occasions. I have not a very long stretch of holidays in view. Even three week-ending days, Friday, Saturday and Sunday, on three or four occasions, if properly utilised, should be sufficient, at any rate, to begin with. Of course, quite a few of the operations happen to fall within the time when schools are generally closed, for instance, for summer. As in the case of additional production, I want to keep my

expectation to the lowest and attempt only that much as would be practicable. This item also would be worked out in greater detail later, after obtaining fuller information from States, but the importance of manure and its collection should be propagated right from now."

Within a week of the issue of the Vice-President's letter, the State Governments were addressed again to acquaint them with the break-up of the campaign stages for the effective promotion of the Japanese method idea. They were requested to intimate to the Union Ministry of Food and Agriculture the number of paddy-growing districts in which they would be in a position to launch the campaign, together with the acreage under paddy and population per district. The Union Ministry of Food and Agriculture were to make available to the State Governments a number of posters, circulars and other material for the use of field workers and the cultivators. It was suggested that 10 field workers might be selected for each of the districts in which the campaign was to be launched. Each of these field-workers, with 10 villages in their beat, was to be provided with 50 posters (five for each village); 200 circulars (20 for each village); one set of flannelgraphs; and two flip-books. The suggestion was made that if the States could take up the printing of circulars, they might select 30 village workers per district, thus extending the campaign to 300 villages per district.

As in all specialised work, the fieldworkers, too, were to be briefed on what they were expected to do. Colossal as the task was, it was suggested that all the States should depute an officer each to visit Delhi, preferably 15 days before the campaign was launched, to receive briefing about the campaign. Back in their States, they were to pass on campaign instructions to the district workers. On the day the campaign was to be launched, various officials of the States, with the help of well-known social workers, were to organise public meetings in all the selected villages to emphasise the need as well as the utility of the new method.

The duty of the agricultural workers, selected by the States for the conduct of the campaign, lay mainly in visiting the villages entrusted to them within a week of the date the campaign started. They were to distribute circulars, give talks, and try gently persuasive methods to induce some at least of the farmers, if not all, to take up

the new method. At the end of the week, the workers were to visit all the villages again, and send in their reports on the reaction of the villagers. These reports were to be channelled through the State campaign officers to the Union Ministry of Food and Agriculture.

For efficient handling of the campaign a suggestion was made that it might be a continuous process. If the first campaign date was March 15, the second was to be April 1 and the third April 15. The same worker was to cover 30 villages at the rate of 10 a fortnight. The Union Ministry of Agriculture requested the State Governments to send in the names of the villages selected by them as well as those of the workers put in charge of each district.

The Union Ministry of Agriculture was to supply 50 thousand copies of a circular on the technique of Japanese Method of Paddy Cultivation in each of the following languages: Assamese; Bengali; Oriya; Marathi; Gujerati; Kanarese; Tamil; Telegu; and Malayalam.

In addition to the above, 10 ,000 copies of the circular were to be supplied in Hindi. The States were to prepare further literature for wider distribution in local dialect or languages. Flip-books containing illustrations and script in English and Hindi were to be supplied for the use of the agricultural workers. The State Governments concerned could have them in local languages for use when meeting the villagers. The State Governments were requested to get the translations composed in accordance with the rough layout given by the Union Ministry of Agriculture, which undertook the printing of 50,000 copies in the language of the area.

In February, 1953, a delegation consisting of the workers of Kora Kendra started on a selfless mission to disseminate the knowledge of the Japanese Method of Paddy Cultivation amongst the officials of the Agriculture Departments and individual agriculturists, who were prepared to experiment this method on their own fields. Their first tour included the main rice-producing States of Assam, Bengal, Orissa, Andhra, Travancore-Cochin, Madras and Mysore. The Union Minister for Agriculture was so impressed by their generous lead, given to so noble a cause, that he addressed a letter to the State Ministers of Agriculture urging all possible co-operation to the visiting delegation.

Dr. Panjabrao Deshmukh wrote:

"I am enclosing herewith the proposed programme of the representatives of the Kora Kendra with a programme of work in all the centres they propose to visit.

"The delegation will consist of Shri Pranlal Kapadia, Shri Lakshidas Asher and Shri Nalin of the Kora Kendra, and Sri H. C. Patil, Superintendent of the Government Agricultural School, Kosabad (Bombay State). It will be appreciated if your Department of Agriculture renders all possible assistance to the delegation, whose main purpose is to give practical demonstration of the method and its various features.

"Since the main promotion campaign of the centre is to be launched on March 15, 1953, I would suggest that you may invite about 50 persons to witness this demonstration. Some of these may be officials and field-workers of the Agriculture Department, and the rest may be energetic non-officials and farmers. They may, as far as possible, be drawn from different districts and centres of activity of your State and should be such persons as are likely to be placed in charge of the promotion campaign. The idea is that the method may reach as much of the paddy-growing areas as possible.

"You will also, I hope, kindly give any help that the delegation may require in procuring good seeds and manures as these demonstrations are designed to train workers for carrying on the work in the States.

"I shall be glad to hear from you of the steps now being taken in furthering the campaign in the State. I would again suggest that, for the present, utmost propaganda for collection of as much manure of all kinds as possible be undertaken. The news about the visit of this delegation may be publicised widely."

The Union Minister for Agriculture was anxious to find out the possibility of fabricating some Japanese implements, generally used in rice cultivation, to assess their scope and application in this country. As the Central Rice Research Institute, Cuttack, already had a number of such implements. It was decided in February, 1953, to send Sri D. N. Kherdekar, Agricultural Extension Engineer, Indian Agricultural Research Institute, to Cuttack to make a detailed study in this direction.

In view of the interest shown by a number of members of both Houses of Parliament in the Japanese Method of Paddy Cultivation, the Union Minister for Agriculture considered it worth while to make the first pamphlet, indicating the brief outline of the method, available to them. Copies of the pamphlet were, therefore, placed in the Notice Office as well as in the Parliament Library in February, 1953, for the use of Members.

On February 17, 1953, the Union Minister for Agriculture, Dr. Panjabrao Deshmukh, gave a third broadcast talk to the nation, this time stressing the great need for all-round greater agricultutal production in the country. He also reviewed the progress made towards inaugurating the campaign for introducing the Japanese Method of Paddy Cultivation.

In the talk broadcast from All-India Radio on February 17, 1953, Dr. Panjabrao Deshmukh said :

"This is my third broadcast in connection with greater agricultural production. I would like to express my sense of gratitude to all—whether he is the Chief Minister of a State or the Minister for Agriculture, or his Secretary or the Director of agriculture, or his men in the field, whether he is the big agriculturist or the small cultivator—for the appeal for better cultivation of paddy has been received with considerable enthusiasm.

"Quite a few excellent workers and influential leaders are prepared to undertake propagation of the method on their own. All those whom I have met during the past few weeks tell me that our sincere appeal is reaching the farthest limits of our country including the villages also. I am thankful for all this. I have had almost no adverse criticism. Many friends have made excellent suggestions, both publicly and privately, for which also I am deeply grateful. All such suggestions, whenever found to be fruitful and beneficial, will be accepted. Let no one with such suggestions refrain from sending them to me.

"There are two facts which, I think, bear repetition. First and foremost, there is nothing new in the so-called Japanese method. As I said before, it is merely better cultivation which was for various reasons not being followed on any appreciable scale. Let there be no misunderstanding that there is anything in the Japanese method which

we ourselves did not know. It was our fault, however, that we neglected to adopt these methods. There were good reasons for this poverty, for example non-availability of sufficient labour, non-availability of proper implements and lack of fertilisers and manures. The second fact which I would like strongly to emphasise is that our drive is not to be based on a blind imitation of the Japanese method. We will concentrate only on such features and methods which have been proved to be successful. Let there be no suspicion in any quarter that we are intent on mere imitation without considering the quality of our land, the nature of our rainfall or the available experience and scientific knowledge. We will practise and persuade others to adopt only those methods which have been proved and tested, and which will definitely bring prosperity to our cultivators.

"I will now summarize the progress we have made since I addressed you last on January 29.

"I have since visited the States of Uttar Pradesh, Bihar, Bombay and Madhya Pradesh. Everyone was enthusiatic, including the Chief Ministers and other Ministers connected with various aspects of agriculture, such as irrigation, cooperation, etc. Ministers in charge of agriculture are, of course, most directly concerned. I have not been content with merely creating enthusiasm. Plans are being worked out to the minutest details and in a practicable manner, for that alone would guarantee results.

"While Uttar Pradesh, Bihar and Madhya Pradesh are busy tackling this programme most earnestly, the State of Bombay is going ahead in a determined manner. They have, like West Bengal, planned 3,420 demonstration centres, which works out at ten centres per agricultural worker. It will be the responsibility of this agricultural worker to organise ten centres strictly according to the Japanese method suitable to the area. Our emphasis is on the suitability of the method according to the area. The Government of Bombay proposes to give not only fertilisers and other manures on loan, but also seed. Besides this, the State of Bombay had on the 27th of January started four training centres, each of ten day's duration, where batches of 25-30 officers of the Agriculture Department will be trained in the new method, I expect these training centres will continue till the sowing time. This will, in addition to the officers, enable farmers also to undergo a period of training, if they so desire.

"Similarly, the experts of the Kora Kendra are now on an All-India tour, arranging practical demonstrations of the method to fifty people at a time. They have started with Assam and will be going to other States, according to a definite programme. I have requested the State Governments to give our friends from the Kora Kendra all co-operation so that during their tour of a particular State a large number of people can become familiar with the new method. The trainees would be so selected as to spread the gospel throughout the State. The first of our pamphlets has gone to all the States. A second and fuller one is being translated into the various languages and will soon be available to the State Governments. Two dozen copies of a film showing how the Japanese cultivate their paddy have now been made in the Hindi language and it would be exhibited throughout the country.

"I have no doubt that I will get the fullest co-operation of all in this task of national revival. It is humiliating for a great nation like ours, with all our resources of land, and with a hard-working and intelligent peasantry, that we should continue to be deficit in foodgrains. The world situation is explosive and God forbid, should there be another war, food imports may either dry up completely or come in small quantities at exorbitant prices. It is imperative therefore, that we should strive to become self-sufficient in food quickly. Provided all of us concentrate on this objective, we should not be surprised if we can dispense with foreign food by the end of the next *kharif*. I do not wish to talk big, nor do I want to paint too optimistic a picture. Let us labour patiently and conscientiously and await the result. The fact is even if one or two of the suggestions that we are making are followed, we should get an increase in our production by about 10 to 15 per cent. If all the steps are taken and instructions followed in suitable places, and if this is limited to not more than two per cent of the land under paddy, we will have more than secured our objective. What could be simpler than this? Let me quote a few figures.

"The total land under paddy all over India is under no circumstances less than 7½ crore acres. One-third of this is under irrigation of one sort or the other. Two per cent of 7½ crores is 15 lacs. The Japanese method fully followed has already given an average yield of not less than 40 maunds per acre. Supposing this land was already yielding 20 maunds per acre, by following the Japanese method the

yield will be doubled ; I would be content to calculate the additional yield only to 13½ maunds or half a ton. In fifteen lakh acres, we should get 7½ lakh tons. This may to-day be a mere arithmetical calculation, but I sincerely believe it is one which can be translated into action without any shadow of doubt. It will, I am sure, be at least granted that the effort is worth making.

"Let it again be remembered that we do not wish the method to be followed in places where rainfall is uncertain, where experience has proved that use of excessive manure is harmful and so on. We want to push it through in tried places where we are cent per cent sure that no harm can come. We also do not propose that the same kind and quantity of fertilisers or manures should be used in every place. The dose will be varied according to the circumstances of each area and according to the advice of the local experts.

"May I now turn to crops other than paddy. ? While we are carrying on the drive to help the paddy-growers, to our utmost, it is not our intention that the other farmers should stand still. In fact, the paddy and non-paddy areas are more or less distinct and exclusive crops like *jowar*, wheat and cotton are grown where ordinarily paddy is not grown. So while the paddy-growers can follow the Japanese method, may I appeal to the growers of these other crops to follow the example of paddy-growers and intensify their activities in similar direction ? While providing fertilisers to the paddy growers, we do not want to neglect the grower of *jowar* or wheat or the grower of cotton.

"As I said in my speech at Bombay before the Indian Central Cotton Committee the other day, we still want to work out our integrated programme. Just as we want more paddy, we want more wheat, more *jowar* and more cotton. Jute, fortunately, is taking care of itself, but I do not wish to leave even jute out of consideration. It should also be remembered that we are anxious to increase the acreage under jute and cotton. So, while we are advising the paddy-growers to choose better seed, to resort to green manuring, to collect every drop of urine and every ounce of night-soil, to make provision for fertilisers, to resort to preparation of seed-beds, adopt interculturing and manuring the crop properly, we also wish the growers of other crops to do the same except the seed-beds which are unnecessary.

"And just as we are trying to harness public enthusiasm and free manual work for the paddy cultivation, the same thing could be done so far as some of the operations for other crops are concerned. For instance, in the case of cotton, as well as *jowar* and wheat, people could take to sowing by hand and resort to a regular and scientific spacing. The school holidays could be timed to enable the school children in the villages and others to help in sowing seed. The second simple operation which could be followed in these areas is weeding and applying manure. Even if only these items are taken up and public support utilised, we should make very great progress.

"I have been trying my utmost to encourage irrigated cotton, because, while we are surplus in short-staple cotton, we are short of it so far as medium and long-staple cotton are concerned. Long staple cotton may probably be both slow and difficult to grow in India, but so far as medium quality is concerned, there should be no difficulty in growing it wherever cotton is grown. By resorting to irrigation, some areas have produced far greater yields. I, therefore, want agriculturists to come forward to take advantage of the facilities of purchasing pumping sets and utilisation of fertilisers on a larger scale. Irrigation would be useful also for *jowar* as well as wheat crops. Here also much smaller acreage is capable of giving us surprisingly larger yields.

"You must have all heard how one of our Krishi Pandits in Hyderabad-Deccan has grown one hundred maunds of *jowar* in one acre. The average is hardly one-tenth of this. The same thing is capable of happening in the case of irrigated wheat, as well as irrigated cotton. I am, of course, referring here to small-scale irrigation where there is sure supply of water. Let me tell you that there are innumerable such places which still remain untapped.

"I, therefore, very strongly recommend to all my agriculturist friends to consider seriously the possibilities of following what I have stated. I may repeat once again that we do not wish to recommend this or any method, where the conditions are not favourable. We deliberately want to confine ourselves to those things and to those places where there is no fear of failure. As far as it is humanly possible, we will try to remove the difficulties in way of our cultivators, but there may be some which, with the best goodwill in the world, neither the cultivator nor we are in a position to remove. To such people, I would

advise patience. But I would implore all those, for whom the facilities are within reach, to do their very best.

"As the son of a petty agriculturist, I am familiar with the hard realities and the discouraging and dismal surroundings of most of our farmers. But I also know that Sacred Earth responds to sincere labour, and whosoever works hard reaps his rewards. This is not only a duty to ourselves, but a duty to the nation, that we should produce more in the same area.

"I wish to convey my sense of gratitude once again to all my innumerable friends who are rendering sincere help in our new task."

Towards the end of February, 1953, steps were taken to enlist the help of the network of All-India Radio to disseminate information relating to the Japanese Method of Paddy Cultivation. Co-operation came from All-India Radio in good measure, and, by early March, 1953, talks on the Japanese method were being beamed from the various stations and in their rural programmes.

A small leaflet, containing all the essential principles of the Japanese Method of Paddy Cultivation was prepared by the Indian Council of Agricultural Research. The information contained in the leaflet was subject to local adjustments. Fertiliser dosages, seed-rate, varieties of improved seed—all these were left to the discretion of the State agricultural authorities. The leaflet was the basis on which the entire promotional material was prepared and more than a million copies or its adaptations were printed and distributed in 12 regional languages all over India. The leaflet stated :

THE "JAPANESE METHOD" OF RICE CULTIVATION

In the Japanese method of growing paddy you must

A. Grow stronger seedlings, and

B. Grow a better main crop.

The first part must be done right, or the second part will suffer.

The second part must be done right, or grain yields will no more than you now produce.

If both are done right, your yields can be doubled or trebled !

GROWING SEEDLINGS BY THE "JAPANESE METHOD"

1. *Plan for fewer seedlings per acre.*

Most farmers in India sow too many seeds. The amount sown depends in part on custom. A farmer today will plant his seed as his father did before him. But by this new method he can save seed, which means that he can save money. Many good farmers plant only 20 pounds of seed for each acre to be put in paddy. Amount of seed sowed will be different for different parts of India. Ask your local agricultural officer how much seed to sow on your land.

2. *Make a raised seed-bed.*

You should plough the nursery bed right after the paddyharvest. If ploughing was not done after harvest, the land should be dug up and clods broken.

Your seed-bed should be four feet wide and three inches above the level of the ground. A space one foot wide should be left between the beds. This allows you to work and weed the seed-bed without injuring the plants.

For each acre you plant in paddy, 1/20th of an acre must be sown for seedlings. This equals 10 beds 54 feet long and 4 feet wide.

If 20 pounds of seed are used per acre of paddy, two pounds of seed should be sown on each 54-foot bed.

Stir into the soil one basket (30 pounds) of compost or cowdung manure for each 8 feet of bed,

For each 8 feet of bed sprinkle a double handful (½ pounds) manure mixture. This mixture is made of equal parts of superphosphate and Ammonium Sulphate.

Smooth the soil, and then cover it with fine compost manure about 1/8th inch thick. Then cover the bed with a thin layer of ash.

The bed is ready for the seed.

3. *Selecting good seed :*

Get the best seed. Ask your Agricultural Officer what seed you should use. Put these seeds into a bucket of salt water. The poor seeds will come to the top. Skim these off and save only the heavy seeds in the bottom of bucket for planting*.

After the seeds have been selected place them into Perenox mixed with water. Leave them in this mixture for 20 minutes.

4. *Planting the seed :*

Two or three days before the rains, plant the seed.

Cover the seed with 1/8th inch of fine earth.

If rains do not come in time, water the bed by water cans.

5. *Caring for the seedlings :*

Seven or eight days after your seedlings come up, go through the beds and carefully remove all weeds. This is important and must be done. If proper amount of water is given, and weeding is done, strong seedlings will be ready early. Your seedlings will be ready to transplant when the sixth leaf has formed. The plant will be 6 to 8 inches high at this time. In no case should your seedlings be left in the bed after they are ready. Late transplanting lowers yields. It is better to transplant early than late.

GROWING PADDY CROP *BY THE "JAPANESE METHOD"*

1. *Preparing the field.*

You should plough your paddy fields right after the harvest. Following the first monsoon rains the field should be ploughed again. Your yields will be higher if a green manure crop is grown for turning under before transplanting.

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* After the seeds have been selected, place the seeds in a solution of Perenox (3 lbs in 100 gallons of water) for 15-20 minutes. Dry the seeds under shade before sowing. In the case of seedlings (when they are 10 days old), spray them with Perenox mixed with water (one part in 200 parts of water Treatment with Perenox is recommended as a preventive against fungus diseases.

Be sure to fill any cracks in the bunds. Pack these well to stop rats and crabs.

To get more out of the land, you have to put more in. Manure must be used to get larger yields. Fifteen to 20 cartloads of compost or cowdung manure is needed for each acre. This manure should be ploughed into the land before puddling. One hundred pounds of Ammonium Sulphate mixed with 100 pounds of superphosphate (or bone-meal) may be used on each acre, but local officers should be asked about this.†

2. *Transplanting seedlings.*

The Japanese treat each seedling as a baby. They pull them out one at a time and are careful not to bruise the stem or break the roots. If the soil they are pulled from is hard it must be broken with some tool so that the roots can be saved. You should not jerk or hammer plants to remove soil.

When pulling up the seedling, weeds must be removed. Weeds transplanted in the fields, grow faster than rice and lower the yields of grain.

The Japanese have shown that planting 15 to 20 seedlings to a hole is a waste. Four are the most that should be planted. In Bombay, where the method is yielding twice as much as the local method, farmers using the Japanese method never plant more than four seedlings to the hole.

By this method the seedlings are planted straight up rather than at an angle. You hold your fingers along the side of the plants and push them into the soil ahead of the seedling. This way your fingers make way for the tender roots. The more roots you save the stronger your plants will be.

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† Apply bulky organic manure to the fields. Immediately after the first shower of rains apply five cartloads (one cartload 1,000 lbs) of farmyard manure or compost, evenly. Green manuring is useful wherever the practice is feasible. Sann hemp and dhanicha are almost universally adopted for the purpose; sann hemp at the rate of 60 lbs. per acre and dhanicha at 30 lbs per acre are broadcast sufficiently early and ploughed into the soil a week before transplanting. In Madras, border crops such as *Glyricidia*, *Sesbania* and *Ipomoea* are grown for this purpose, and 6,000-8,000 lbs. of green matter can be produced per acre.

The Union Ministry of Food and Agriculture organised a four-day exhibition in Parliament House, New Delhi, to illustrate the working of the Japanese Method of Paddy Cultivation. The picture shows a section of the exhibition.

Your plants should be set in 10 inches squares. This is done by planting them in straight lines 10 inches apart in the line. There are 10 inches between each line.

To speed up planting, have two workers hold a long string in a straight line, and on this string put markers 10 inches apart. The seedlings are placed in the soil at the markers. Then the string is moved over 10 inches and the planting at the markers is done again. ‡

3. *Caring for the crop*

No weeds should be allowed to grow in the crop. After the crop has grown for two weeks the farmer must go through and remove all foreign growth. To get the highest yield, you may use 100 pounds of Ammonium Sulphate mixed with 100 pounds of superphosphate one month after transplanting. (Get local recommendations). You should work this manure into the soil around the roots of the plants; working around the roots increases yields.

From time to time you should move a soil scratching tool between the plants. About two weeks before flowering, field work should stop. Any more cultivation will lower yields.

To acquaint the cultivator fully with the new technique of paddy cultivation well in time before the sowing started in the ensuing *kharif* season, the State Governments were sent a set of circulars enclosing a draft manuscript prepared by the Indian Council of Agricultural Research. The State Governments were requested to proceed with the work of finalising and distribution of the campaign material for active promotion of the new idea.

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‡Population density per unit area is an important factor determining the yield of r ce. Spacing is to be adopted in transplanted fields according to the varieties grown, fertility status of the soil, and the time of planting. In soils of average fertility with 10" spacing between lines 3-5 seedlings per hole for early maturing varieties (*i.e.* 120 days or less) and 1-3 seedlings per hole for late maturing types may be the optimum requirements. In highly fertile soils lesser number of seedlings need only be planted with the same spacings. But in the case of late transplanting of late types, more seedlings will be needed.

Regional and local experience may give specific data for this and other aspects discussed above.

The State Governments, alive to the situation and to the needs of the campaign, extended their full co-operation to the Union Ministry of Agriculture in launching the campaign on a very wide scale in the country.

With a view to intensify interest in the campaign, the Indian Council of Agricultural Research decided to give prizes to the agricultural workers in charge of the campaign in the various districts. As the field-worker is the most important cog in the machinery of a campaign of this magnitude, it was considered that the prize scheme might lead to a more enthusiastic working of the campaign, and at the same time afford a chance of evaluating the success of the campaign. The prizes offered were : (1) District Prize : for the two best workers in the district, at the rate of Rs. 250 and Rs. 150; (2) State Prize : for the two best workers from among all the districts at the rate of Rs. 500 and Rs. 250; and (3) All-India Prizes : three prizes of Rs. 1,000 each for Part A, B and C States. Under the scheme the States were to incur an expenditure of Rs. 4,750 each, the Union Ministry of Food and Agriculture providing Rs. 3,000 for the all-India prizes. The awards were to be made on the basis of the points awarded according to the criteria laid down below :

(i) Only those farmers who adopt all the six features which are regarded as being essential to the Japanese method may be taken into account for judging the worker's eligibility for the prize. These six features are :

(a) Raised seed-bed for growing rice seedlings ;

(b) Low seed-rate ;

(c) heavy manuring of the crop in the seed-bed and in the field ;

(d) transplanting paddy in rows in the field ;

(e) transplanting 4-5 seedlings per bunch ;

(f) interculture in rice-fields, especially mulching, that is, disturbing the soil round the roots of the plants. In places, however, where a raised seed-bed is not considered necessary to fulfil the object of easily draining away water and uprooting of plants without damaging the roots the first condition need not be taken into account.

Thus, conditions (b) and (f) are not relaxable and condition (a) is optional depending on the tract and local conditions.

(ii) The worker was to prepare a list of all such farmers showing against each what he had done in respect of each of the six items in a tabular form. This form might include a statement of local practices side by side.

(iii) The area on which the Japanese method was adopted by the cultivator was to be shown. The minimum area to be included was to be decided upon by the local agricultural authorities, namely, the Director of Agriculture.

(iv) Only those farmers who do not belong to the same family or the same household be taken into consideration. The total number of villages in which the method was adopted and the total number of demonstration plots laid down in each of the villages were to be taken into account.

(v) The worker should submit his records to the District Agricultural Officer, who should scrutinize and supplement it by spot inspection on the field. As he would not be able to inspect all the fields, he should inspect a representative sample of the acreage and state how many effective entries the worker has secured. This was to be taken as the basis for judging the success of different workers.

The State Governments were at liberty to announce the scheme with such modifications as was necessary to suit local conditions. Most of the State Governments warmly responded to the scheme and worked out the scheme well.

On March 5, 1953, one representative each from the State Governments arrived in Delhi for the briefing planned earlier. On the first day of the briefing, the Union Minister for Agriculture, Dr, Panjabrao Deshmukh, addressed the representative gathering of officers from the States. Briefly, he explained the reasons for promoting the campaign and invited members to draw up a programme of action and suggest steps to be taken for day-to-day implementation from March 15, 1953. Their attention was drawn to the need for collection of manures, establishing collection points for making available compost,

bone-meal and other organic manures, as well as selling points for fertilisers, seeds, etc.

Dr. Deshmukh stressed the value of green manure. They were urged to start work on the non-controversial items of the method, leaving the controversial subjects to be dealt with later. The Union Minister for Agriculture did not want to stress and insist on any particular aspect against the wishes of the States, whether in the use of fertilisers or any other item, and requested the campaign officers present at the briefing to concentrate their efforts on achieving increased production. The Secretary of the Union Ministry of Food and Agriculture announced at the meeting that a reduction had been effected in the price of sulphate of ammonia for the purpose of the campaign. The new price was Rs. 290 per ton, ex-Sindri factory. The reduced rate would also apply to the stocks already with the States. and any difference between the price paid previously and the new price would be met by the Union Government.

The Conference considered the plan of campaign drawn up by the Indian Council of Agricultural Research. The principles laid down for the promotion of the campaign highlighted these points :

(i) Select only known and good men to carry the detailed techniques in the Japanese method ;

(ii) arm these men with complete information on the techniques in the Japanese method :

(iii) arm them with literature and with teaching techniques ;

(iv) assign them to villages where they are known and respected ;

(v) have them to talk to villagers in small groups, using the flipbook. In larger groups they may use the flannelgraph ;

(vi) have them to put up the poster and pass out the circulars ;

(vii) have them suggest that some good farmer try the new method ;

(viii) get farmers to agree to try it ;

(ix) he may promise the farmers to return and help with the trials ;

(x) return to villages that show the most promise, and concentrate on these ;

(xi) put on trials on the most promising tracts with the best farmers ;

(xii) have these trials supervised closely and often ;

(xiii) have your men encourage those who try the method ; give them help so that they get fertilisers, labour, and any thing they need to succeed ; and,

(xiv) finally, follow up in these co-operative villages with other improved practices.

The State campaign officers were given adequate promotion matérial for launching the campaign. This consisted of :

Leaflets—English 10,000, Hindi 25,000 ; *Flipbooks*—English 10,000, Hindi 25,000 ; *Flannelgraphs*—5,000 ; *Posters* (Hindi)—50,000 ; Posters (blank)—90,000 ; and *Seed treatment* 10,000.

CHAPTER IV

NEW METHOD GAINS GROUND

A streamlined campaign of a magnitude unknown in India earlier, so far as agrarian schemes go, came into being on March 15, 1953. The campaign for the Japanese Method of Paddy Cultivation was on. India had decided to increase her paddy production by a concerted effort.

On that memorable day, which India would remember with gratitude for years to come, every means of imparting the new technique of paddy cultivation was pressed into service. Plain literature, the press, radio, extension aids, films, demonstrations, talks, exhibitions—all combined to spur the message of the new method to the nation. Truly, a revolution in paddy cultivation was in the making.

To mark the inauguration of the campaign, Dr. Panjabrao Deshmukh, Union Minister for Agriculture, broadcast an appeal to the nation :

"To-day is the 15th of March, the day which we had fixed for the starting of a more intensive drive for increasing rice production in the country. During the last few weeks we have been busy working out the details of the programme of publicity and demonstration, and perfecting the machinery as far as is possible under the circumstances, of distribution of essential supplies such as seeds, manures and fertilizers with the State Governments. Fortified by the support I have received in all quarters, Government as well as non-official, from persons of various shades of opinion, townsfolk as well as cultivators, I feel confident that we should be able to achieve the modest target that we have set before ourselves.

"Supplying food to growing population has confronted modern governments with a difficult problem and us in particular, because two-thirds of our population are rice-eaters and there just is not sufficient rice available in the world to meet all the demands. Rice, according to some, is likely to become one of the enduring scarcities of the world. The Government recognise this, and hence we are

launching upon a drive today, which I hope will enable the country to reduce its rice deficit by several lakhs of tons in one season alone.

"I should like to tell you now what we have done since my last broadcast on this subject. While all State Governments are trying to do their utmost for the collection of more and more manure of every kind, and while all other arrangements are proceeding apace, we have been much worried about the high price of the sulphate of ammonia. Although it is a well-established tact that scientifically recommended doses of sulphate of ammonia cannot but increase the yield, the price at which it was proposed to distribute was not, we felt all along, sufficiently attractive to every cultivator and for every crop. It is common knowledge that those who use sulphate of ammonia for cash crops can afford to pay a high price. But in many areas the price that we had fixed could not be so remunerative as to attract the common cultivator unaccustomed to its use. I am very happy to declare that we have succeeded in this attempt of ours and succeeded to a remarkable degree. From the price of Rs. 366 per ton that ruled during the previous year, we have brought the price down to Rs. 290 per ton, ex-Sindri. This means a reduction of Rs. 75 per ton from the previous year, and Rs. 45 per ton from the price we had declared.

"We also propose to examine the cost of distribution including the railway freight. We do not think our efforts in this direction also would not meet with any success at all. We are confident that we will be able to save at least Rs. 15 per ton by trying in these various directions. There should, therefore, be a net reduction of not less than Rs. 60 per ton as compared with the price payable by the cultivator that we had thought of in the beginning of this year, or Rs. 90 per ton on the last year's price. This would mean a reduction per maund of Rs. 3/4/9 over last year's price which is the only price known to cultivators as no distribution at the revised price of Rs. 335 has yet taken place. This is a very substantial reduction, and I have no doubt that the main difficulty in the popularisation of the fertiliser has now been removed. The other day when I went to some villages in vicinity of the Pusa Institute in Delhi, the cultivators there requested me that the price of the fertiliser should be reduced by a rupee per maund. It was a very pleasant news to them when I told them that the reduction may be in the neighbourhood of Rs. 3/4/0 per maund, or so.

"In addition, we have also agreed to scale down the price of the stocks already held by the various States to the level of the new price The States will now be able to make, I am sure, the fullest use of the fertilisers under the new campaign and their task will be very much facilitated. When I had discussions with the State Governments in the beginning, I could not give them any definite assurance, although I had told them that I would try and give them the fertilisers as cheap as possible. Even our most optimistic calculations did not envisage the reduction we have actually succeeded in obtaining. I, therefore, think that this is one of the most welcome decisions taken in furtherance of our efforts to increase food production, especially because this reduction will apply to all the users of fertilisers. This should now help everyone in achieving the targets, if not exceed them.

"It is a well-known fact that heavy manuring of the nursery and the rice-land is one of the most important features of the Japanese method. One would have thought so, for to get more out of the land, more has to be put in. The return of residual organic matter to the soil either directly as vegetable waste, or indirectly, was a natural process when village communities were smaller and more self-contained. The old custom of returning organic waste to the land by composting it, thus preserving the valuable plant foods it contained, has never been quite forgotten in our country, but there is a danger that unless more active steps are taken, it might fall into disuse. It is almost an agricultural truism that improved food varieties of crops demand heavier manuring to show their best performance, and I feel that while a great deal of varieties of seed has been distributed, these have, as a general rule, been grown with whatever manure the cultivator had at his disposal and could spare easily. The net result has been a falling off in the average yield in our country. While improved varieties have gone out in many strains, they do not get the amount of nutrition they need, and for a time they have drawn upon the accumulated fertility of our soils. Very soon the soil bank gets depleted, because of the heavy overdrafts on it, and today we are left with the double evil of low crop yields and soils denuded of fertility.

"The big irrigation projects which we have in hand will force up yields, but unless cheap water is linked with an efficient system of manure distribution, a higher production of foodgrains might still elude our grasp. The obvious thing to do is to ensure that our farmers utilise all

available organic manure on the fields and liberally supplement these with additional dosage of fertilisers recommended by the experts.

About ten days ago, I had up here in Delhi a large number of officers from the different States who are to be in charge of the campaign in their respective areas. A detailed plan of action has been drawn up, according to which the States will launch their drive for carrying the information on the Japanese method of rice production to the remotest village in the country. From now on till the sowing season, the work of introducing the new method will consist of promoting it through information material, and by what, to my mind, is more important, training local workers and through demonstration plots. A demonstration training centre has been started at Karjat in Bombay State, and a number of demonstration plots are being laid down in the campaign area in cultvators' fields. Half the fields will be given local normal treatment and the other half will be under the new technique.

I have always stressed the importance of making the seeds and fertilisers available to the farmer, as far as possible, at his door, so that he can make practical use of the advice given to him. Ultimately, the success of the campaign will depend upon how readily these are made available to the cultivator, and in this campaign care must be taken to see that his requirements are fully met and no pains spared to fulfil this. From today onwards, the efforts of the agricultural workers selected for this campaign are to be concentrated on making the necessary arrangements and locating people who raise good seedlings for sale, so that it may be possible to make the seedlings available for transplanting where the cultivators find it impossible to raise their own seedlings. Extensive use of manures, such as sludge, will also be propagated and steps have been taken to provide an incentive to the workers in various districts and States where the best results are achieved.

Various States have set up targets of the acreage they wish to bring under this new method during the ensuing *kharif* season. This varies from 30,000 acres to 9 lakh acres. For example, in Uttar Pradesh alone, 4,00,000 acres out of the 9½ lakh acres of irrigated paddy will be covered by this campaign, and in West Bengal as many as 9,00,000 acres. Bombay has set apart 5,50,000 acres and is opening 3,000 centres in 12 districts for training workers. West

Bengal and Assam are laying down 3,000 and 5,000 demonstration centres, respectively. Even small States are not lagging behind. The State of Coorg with a total area of 80,000 acres is including 8,000 acres in the campaign, and Bhopal which has only 2,000 to 3,000 acres under transplanted paddy will set up 200 centres. We naturally expect more intensive work in the Community Project areas. I am happy to tell you that a Collector in the State of Bombay is trying to bring every acre of land taken up under Community Projects under the new method. We have also decided to give large prizes for commendable work in these as well as other areas and thus recognize the good work done.

In this campaign, we have the wholehearted cooperation of all States ; and the recommendations in manurial and seed rates have been fully examined by various States who have made variations to suit local conditions. The campaign which is being launched, today, is a tribute to the progressive outlook of the States which are putting forth their best to ensure the success of the campaign. For once a new approach is being made for the farmers to adopt a new technique on a mass scale. Special requests for spreading the knowledge have been addressed to teachers, professors, chairmen of Bar associations, district magistrates, revenue officers and others. The various steps to be taken have been explained and briefly so that even a non-agriculturist can be briefed on the working of the method. I hope none of them will put the literature on the shelf and forget all about it. All that we expect them to do is to see that as many more people as possible come to know about it and then pass the information to every possible cultivator.

In this respect, I have just one more point to make. I am sure the children of the cultivators who attend village schools, could be of great help to their parents during the sowing and harvesting periods when labour is scarce. Remember, free labour is intended to be used when many desirable things cannot be done owing to the great scarcity of labour at that particular time. There is no intention that free labour should cause any unemployment to existing labour. I have received reports of youth organisations springing up in certain parts of the country. In Mysore, 37 young farmers' clubs have been organised with a membership of nearly 600 and one of them is a girls' club. These village youth are taking on the

responsibility for conducting certain rural projects, such as sanitation, renovating wells and composting. Similar clubs have been started in Pepsu and the Punjab also. It would be a wonderful thing if we could harness the energies of young farmers through our villages for increasing food production.

"And so together with the great dams that are being built, the Community Projects that have been started, we are also launching this great drive for the popularisation of the Japanese Method of Paddy Cultivation. The country is ready for it. To my mind, it merely represents a bold and yet simple experiment. We can succeed if we put forth a great effort in which vast numbers of our people join and co-operate. So I appeal to you all for this co-operation in this drive for increased rice production, which ultimately is a war against poverty and ignorance, against malnutrition and high prices.

"We may do without luxuries and even without many necessities, but we cannot do without food. If we do not produce enough rice in our country, we become dependent upon other countries, and in a matter like food, we cannot afford to be so dependent. Let us once for all put an end to the deficit in rice, which has compelled us to put our money into buying food from abroad. I hope, therefore, that this task will be undertaken with all earnestness and strength of will, and that good fortune will crown our efforts.

"In my last broadcast, I had stressed the importance of the cultivators of wheat, *jowar* and cotton, taking advantage of the opportunity and resort to as many of the improved methods of agriculture as may be considered beneficial for these crops. *Bajra* and maize may also be brought in. To all these cultivators, the reduction in the price of the fertilizer is bound to come as a great boon. I have no doubt, therefore, that the growers of these crops will come forward in larger numbers so as to utilise the fertilisers on a larger scale. May I again utter a word of caution ? Because I do not want, as a result of this advice, that anybody should come to grief and curse us. Before using the fertiliser I would request them to consult agricultural experts in their own States. The only danger where harm may come is the application of an overdose of these fertilisers at a time when there is no rain or after which no rains fall. In the case of irrigated lands there is

no danger but even under dry cultivation, if the proper time is chosen for the application of ammonium sulphate, and the dose is not excessive, I feel certain, utmost possible benefit by way of increased production can be secured. The same thing should apply also to the unirrigated paddy-growers. If they choose the proper time for the application of the fertilisers, I have no doubt it can be used with tremendous advantage even in non-irrigated paddy fields.

"In one of my broadcasts I had suggested the utilisation of the energies of school children for such simple operations as transplantation, etc. Some one has criticised this move by saying that transplantation is a difficult, expert job, and boys and students would not be able to do it. I do not know what this gentleman is thinking of and with what authority he speaks. Most of the boys and girls who go to school are not less than about six years of age, and the actual operation is so simple that there should be no difficulty in utilising them for transplantation. But I am prepared to go further. It is not suggested that everybody must do the same work. These smaller children can help by fetching the seedlings, holding the rope or do some other such light things, leaving the transplantation to slightly older boys and girls.

"The publicity material prepared by us is expected to reach every one interested in this. May I therefore suggest that whosoever somehow does not get it should kindly drop a post-card to some responsible official in that particular State. I am very happy to say that there are many prominent people who are very enthusiastic about rendering every possible help. To a friend in Madhya Pradesh, Shri K.P. Pande, the proposal of exchange of one maund of rice for one maund of fertilisers was extremely welcome, and he suggested that he would like to undertake this work and propagate the matter in a large area in the Jubbulpore district. There are other persons equally anxious to take up the cause. There may be many more whom we have not been able to reach so far; but I would like to recommend them the instance of Shri K. P. Pande, so that they may also do whatever lies within their powers to help us in growing more paddy."

A fortnight later, helpful developments took place in that the Community Projects Administration came forward to spread the gospel of the Japanese method in the Community Project areas.

A directive issued on April 2, 1953, to all the State Development Commissioners spotlighted the campaign. It read :

"You are aware that the Government of India have recently launched a countrywide campaign for the promotion of the Japanese method of rice cultivation, which aims at intensive cultivation in order to maximise acre yields in all rice-producing areas of the country. In the Community Project zones efforts can be directed towards encouraging intensive cultivation of paddy by using improved seeds, seedlings on raised seed beds, heavy manuring of the crop in the seed-bed and in the field, transplanting seedlings in properly spaced rows, giving necessary interculture, etc.

"The State Departments of Agriculture are preparing suitable literature and technique material for the use of propaganda officers and farmers on "things to do" in this connection. The campaign was launched on March 15, 1953, through their agency. You may, therefore, arrange to obtain the literature from the State Department of Agriculture and issue directives to the Project executive officers in the rice areas to work on the lines suggested in such literature. The Project executive officers may also be asked to work on the lines suggested in such literature, and in close conjunction with the State agriculture staff, securing their help and advice, as and when required, in the execution of the programme.

"As the work has to be initiated soon, I would appreciate if you please make it a point to secure the literature at your earliest convenience and pass it on to the Project executive officers in the rice areas for their use."

The progress of the campaign did not belie expectations. Special care was taken to see that the initial enthusiasm did not lag behind as the days went by. The Union Minister for Agriculture, Dr. Panjabrao Deshmukh, took personal interest in the success of the campaign. He spent hours inspecting different plots where the Japanese method was being practised. He discovered that, despite the misgivings and doubts on the part of some critics, the new method was succeeding uniformally everywhere. Dr. Deshmukh found that Balaghat in Madhya Pradesh had achieved a record crop. A small village in that area, Paraswada, had a very promising crop under the Japanese

method, and, in another, the height of the paddy was over eight feet and the crop was yet green.

Considering the similarity of agricultural conditions of rice-growers in India and Japan and the wide disparity in their per acre yields, the Government of India decided to send a deputation of rice technicians to Japan to study the various techniques followed in paddy cultivation, breeding and extension practices. It was felt that the study of the delegation would be of special value to India for finding ways and means of stepping up yields.

The deputation led by Dr. N. Parthasarthy, Director, Central Rice Research Institute, Cuttack, left for Japan on June 3, 1953. Their study tour continued up to September 11, 1953.

While in Japan the delegation received the co-operation of Section Chiefs of the Ministry of Agriculture and Forestry in Japan. The delegation met several agricultural officers and scientists to secure first-hand knowledge of the background of the economic structure as well as the steps taken by the Government of Japan to improve rice production in the country. Their report proved a valuable document.

The salient features of the Japanese Method of Paddy Cultivation, it was pointed out, are:

(i) The attention paid to the raising of nurseries and the low seed-rate;

(ii) use of high-yielding, improved varieties and intensive manuring of the crop by organic and inorganic fertilisers;

(iii) transplanting of the crop in lines and inter-culturing;

(iv) attention paid to the control of insects and diseases ; and

(v) the enormous amount of personal attention the crop receives from the farmers and their receptivity to new ideas.

Japan is the first country in Asia which started using artificial fertilisers for crops even before the beginning of this century. The soils of Japan are heavily fertilised in comparison with other countries. When the fertiliser industry suffered during World War II, the production of

rice also dropped, showing that the high rice production had been achieved in Japan, mainly through the intensive use of artificial fertilisers.

Dr. Shirname, Director of Agriculture, Bombay, wrote on October 29, 1953: "The experiment in the Japanese Method of Paddy Cultivation in the State proved wonderfully successful."

Reports of continued success of the new method poured in from several parts of India. Random specimens are;

On October 30, 1953, it was reported from Hissar (Punjab) that a farmer of Jivan Nagar, in Sirsa Tehsil, harvested 66 maunds 7 seers and 14 chataks of paddy per acre on his farm under the Japanese method.

Kisans of several villages in Nimiar district of South Madhya Bharat, who had adopted the Japanese Method of Paddy Cultivation, had a bumper crop, said a report from Indore on November 17, 1953.

Per acre yield of 112 maunds of paddy in Pipalgarh village, in Sindwa Tehsil, was achieved while the maximum yield per acre in the area previously was about 20 maunds.

Before leaving India for Rome to attend the biennial conference of the Food & Agriculture Organisation of the United Nations, Dr. Panjabrao Deshmukh, Union Minister for Agriculture. gave a talk from All India Radio on November 20, 1953, on the Japanese Method of Paddy Cultivation. He said :

"I had interested myself in the Japanese Method of Paddy Cultivation personally as soon as I came to know of it, and had taken the earliest opportunity of visiting the Kora Gramodyog Kendra where it had been practised since a few years before. On discussing it with our experts, the views expressed were:—

(1) That there was nothing startingly new in it;
(2) that most of it was being already practised in India;
(3) that it was not tried on a sufficiently large scale to enable us to recommend it wholesale and for the whole of India; and
(4) that the first thing to be done was to try it out on a large scale ourselves.

"On 7th January, 1953, we met in a conference of Food Ministers. Rafi Sahib being unwell, I was called upon to preside. There I mentioned my favourable impression of the Japanese method, but added also what the experts had to say about it. On this the Prime Minister expressed great annoyance and said that if this was all known to our experts, why did they not practise it? This served to strengthen my resolve to throw away the extra caution of the experts, their conservative attitude and go ahead, full swing. I am happy to say that the experts themselves had no objection to propagating the method, subject to the advice of the agricultural officers in such respects where expert knowledge is undoubtedly beneficial. This was thrashed out in two days and on the 10th of January, 1953, I broadcast on the Japanese method from All India Radio. Within the next ten days I not only held more than one conference with all the experts who knew about it and the representatives of the Kora Gramodyog Kendra, but formulated a definite scheme of intensive countrywide propaganda.

"On closer examination I had found that most of the items in the Japanese method were those which appeal to commonsense and were merely such as any good cultivator would follow, because they were all methods of better and cleaner cultivation. There could be room for expert opinion only in two or three respects. Firstly, on the question of spacing between the two plants and number of seedlings to be put in each place, and, secondly, on the kind and quantity of manures and chemical fertilizers that should be used. For the rest, it was unanimously agreed that there could be no danger in propagating the methods on the largest possible scale. After we had decided upon the propaganda, I had been to Calcutta. The Director of Agriculture had propounded a very similar thing, as early as 1949, when he was in Orissa. But like the Kora Kendra people he could not get much of a move on. All these are significant facts in the present context. It is for this reason that I have taken some pains to state them frankly and in detail.

"It was natural that some of our people should be critical. Some uncharitable ones thought this was a sort of a stunt on which we will spend much money, make some noise about, and then allow the whole thing to fizzle out. Some had the strongest objection to the name without bothering to know a syllable about the method. They said the Japanese method was most costly and the Indian farmers have no money to invest on the same scale. The

Japanese method", they next complained, "requires more water which is not available everywhere." I had stated more than once that none who had no assured water supply need try, that we were proposing it to be tried only on a very limited scale, that part of the expenditure would be provided by the Government in the shape of loan of fertilizers and good seed, etc. Thirdly, we did not in fact, spend a single pie on staff, etc. From the Central funds we had sanctioned a lakh of rupees, but actually spent hardly half of it, all on preparation of publicity material of various kinds. Gradually, however, the people's prejudices died down, and with the unstinted and valuable co-operation of the Gandhi Smarak Nidhi and the Kora Kendra people, we were able to arrange country-wide demonstrations of method.

"Many State Governments, especially the Bombay Government in the Agriculture Department, took up the matter with great enthusiasm. This, without any cost to the Central Government except on publicity, we have achieved, in the course of hardly six months, something of which all of us may be justly proud. It is gratifying that the experience is uniformly satisfactory. Although this was the first time, and many people's doubts were not fully resolved, there were as many as 18,831 demonstration plots laid in the cultivators' fields, while the number of Government farms, where also similar experiments were held, was 256, making a total of 19,087. As many as 634 training centres were opened. There were 21,548 propaganda meetings. These figures refer to only those items and those places from which reports have been made available.

"With a view to see that we commit no mistake on account of over-enthusiasm, we had made our suggestions subject to the opinions of the Agriculture Departments and their officers in the various States. For instance, we did not insist upon raised seed-beds where the opinion was expressed that they were unnecessary or impracticable. We also suggested a seed-rate of about 20 lbs per acre with the same desire to err on the safest side. We have, however, now come to a definite conclusion that unless absolutely impracticable, raised seed-beds with their careful preparation and proper manuring is one of the greatest assets in the Japanese method.

"Every one knows of an unprecedented flood in the districts of Ratnagiri, Colaba and Kolhapur. All ordinary seed-beds were washed out but the raised seedbeds

remained intact. They saved these districts from a grave situation and gave them seedlings distinctly better than they ordinarily use. The seed rate that we had recommended also was definitely excessive. We can now safely recommend a maximum of 10 lbs. per acre, although in most cases 5 to 7 lbs. per acre is quite ample. I am personally a believer in lesser seed-rate, of course, not indiscriminately, and without knowing the nature of the soil and the rainfall, but I think if India suffers in production through any one single defect, it is due to excessive seed-rate. On the one hand, we lose valuable grain and seed, and, on the other, we make it impossible for the plants to grow to their fullest capacity. A farmer in Bombay has sown only 2½ lbs. of paddy seed to an acre and without detriment to the crop. His spacing also was as high as 15" x 12". He expects to get an yield of at least 60 to 70 maunds per acre or 5,000 to 6,000 lbs.

"There is another concrete instance which proves how raised seed beds are important and profitable. One Shri Dakhwe made fine seedlings on well-prepared raised, seed-beds with 11 lbs of paddy. For an acre of his cultivation less than half was ample. The remainder he sold for Rs. 183.

"So far as spacing is concerned, if all the items in the Japanese method are carefully observed, 10" x 10" is by no means excessive. This can safely be increased from 12" right up to 15" as in the above instance. The advantage of wider spacing gets reflected in a still lower seed-rate, in the lesser labour required for transplantation, in more sun rays and nutrition available for each plant, more room for better tillerings, greater ease of weeding and inter-culture operations, etc. Secondly, this may well do away with the tying of the strings for preventing logging because it would not take much labour to tie every four plants together by the stalk of the same rice plant. Many soils also require some phosphate, and a larger dose right up to the 400 lbs. of ammonium sulphate not only does no harm but has positively given larger yields.

"All over India, I must have myself seen about 100 different plots under the Japanese method. Everywhere they were done side by side with the ordinary method, and everywhere the improvement was anything between 50 to 300 per cent. Each plot was vying with the other, and the average height of these plants was nowhere lower than 5½ to 6 feet but what I saw in Paraswada, near Balaghat in Madhya Pradesh, may probably be a record so

far as height is concerned. The height of this stalk seen by many officers of the Madhya Pradesh Government and the Minister for Industries of that State measured over 8 feet. The crop was still green and could be expected to grow by at least 3" to 4", if not more I wonder if this would constitute a record. Of course, the individual cultivator had not only used ammonium sulphate but had used a profuse quantity of night soil. Indeed this is a part of what the Japanese do ordinarily. It is well known how they use every bit of urine and night-soil immediately it is available. The average is well over 53 maunds per acre.

"In spite of our efforts at publicity, however, the method had not reached many districts and in some places the people had not even heard of it. But considering that this was the first year of trial, the results have been more than satisfactory. Whosoever has seen these plots is convinced of the efficacy of the Japanese method and is enthusiastic about it. As a result of this, we have no doubt that we will achieve much greater success next year, even if we do not do much propaganda or undertake greater publicity.

"But we are not going to rest on our oars and it is for this reason that I have taken this opportunity of speaking to the nation to make a firm resolve to do everything on our part to propagate the method and give to the cultivators whatever assistance we can. The larger resort to the Japanese method has reflected in the consumption of ammonium sulphate also. Final figures have yet to come, and a month and a half yet to go, but it is obvious that the consumption of ammonium sulphate during the year 1953 is likely to be very nearly double that of the previous year, 1952. This itself and even without the assistance of the Japanese method means larger production. A veteran rice-breeder and Deputy Director of Agriculture, Rice Zone No. 1, in Madhya Pradesh, told me on 26th October, 1953 :

"With the application of 40 lbs of nitrogen and 40 lbs. of phosphate over a base dressing of 10 cart-loads of farm yard manure, Luchai X Burma cross is easily capable of giving an yield of over 5000 lbs of paddy per acre". It is also highly gratifying that in most parts the rains were timely and ample, and the use of fertilizers has given surprisingly high benefit, but there is room for expansion and much larger consumption of fertilisers.

"The saving in the seed is of course, a colossal factor. I enquired into the prevailing seed-rate wherever I went,

and whereas in the Kangra Valley it is 96 lbs, even in Government-managed and Government-supervised farms, to the acre, in many parts it is as high as 120 lbs per acre. One can easily calculate the benefit, apart from larger production, that the cultivators would derive if they could use only 7 to 10 lbs per acre. Even if they go up to 20 lbs per acre it would mean so much good seed saved.

"Just imagine the other beneficial result flowing from this. Wherever one goes, one finds deficiency of good seed. In spite of so many years of Agriculture Departments, we have yet much room for progress in making larger quantities of good seed available. Now, if we distribute the good seed that we have only to better cultivators. who will act up to our advice and give them not more than 10 lbs per acre, we will be covering with the same seed an area which will be anything between 8 to 12 times as much. If any State has distributed seed, which will suffice for 100 acres, the same seed would be propagated in as many as 1,000 to 1,200 acres. What a marvellous difference this one fact will make, knowing as we do that good seed alone is capable of increased production up to 15 per cent.

"Secondly, most of the items in the Japanese method and especially the lower seed-rate can be, with some modifications, made applicable to almost every other crop. The consequent advantages are apparent. They save seed; they give better produce and will also contribute to saving of labour. We allowed people to talk loosely and say that the Japanese method is costly. Not to contradict too many of our critics we said, "Yes, it was costly", but I am happy to say that some cultivators at least are prepared to come forward and demonstrate that even apart from greater yield the Japanese method does not cost very much more; in fact, in the opinion of some, definitely less. We do not even now want to take up the cudgels with those who may not agree with us; but one thing I would like to point out and that is, that apart from use of more manure and fertilisers, the remaining operations become far easier and could be carried out far quicker than under the ordinary method, and there is no doubt that if our people have little practice and devote some more thought to it, we would be able to prove that on the average the Japanese method does not cost much more.

"What is still more significant is that the same thing can be repeated with regard to other crops, such as

wheat, *bajra, jawar, ragi* and almost every other crop. Indeed, in Bombay and Saurashtra, it is already under way and with equally striking results. I have no doubt our efforts will succeed, and if that happens, the year 1953 and the commencement of propaganda in favour of the Japanese method should mark a new epoch in the history of Indian agriculture.

"The food deficit should be a thing of the past and we may soon be confronted with surplus stocks. I have faith in what I am speaking about, and if there is the same co-operation, as we received this year, India's shame in not producing sufficient for its own consumption should be wiped out without any delay. When the new acreages in their thousands would be irrigated, we need not dread any longer even small natural calamities which, in a country of our dimensions, are inevitable.

"As has been already declared by our Ministry, we do not propose to import any rice this year. But, if circumstances are favourable to imports, all the rice thus imported, together with the wheat under the International Wheat Agreement, will go to build up reserves. We have thus not only turned the corner so far as food production is concerned, but are definitely on the road to more propitious and prosperous times."

The time had now come for the evaluation of the campaign on the Japanese Method of Paddy cultivation and for considering plans for the continuance of the campaign. These were considered at a conference of the Central Agricultural Information Committee held on December 15, 1953, at New Delhi. The members of the Committee held the view that the evaluation of the campaign might be left over for the next meeting, and in the meantime the campaign should be kept alive by creating fresh interest. A headquarters committee was, therefore, formed to process action in this direction.

It was clear that very encouraging success had been achieved for stepping up the rice production in India by introducing the Japanese method of paddy cultivation. Indeed, the results obtained were beyond expectations.

In the first year of the campaign, the new method was tried on a limited scale in 25 States over an area of little more than 400,000 acres. But even so, the gains were significant and impressive, recording an estimated yield of

nearly six lakh tons of paddy against the previous figure of two lakh tons. The maximum yield obtained in many individual cases exceeded 80 maunds per acre, while in West Bengal it touched 161.5 maunds, and in Hyderabad 145 maunds.

The highest average yield per acre recorded, however, was in Travancore-Cochin with 65 maunds; in Rajasthan 60 maunds; and Madhya Pradesh 58 maunds. The average additional output per acre was the largest in Madhya Pradesh with 38 maunds, followed by 35 maunds in Rajasthan and 28 maunds in Bihar.

There was no gainsaying that the new method had proved fruitful. It was, therefore, decided to have a concerted drive to intensify the campaign still further and a second campaign started on the anniversary of the first—March 15, 1954,—with a target of two million acres.

The State Governments were addressed on the matter and the campaign for 1954 was laid down with such changes as were dictated by the experience of the previous year.

The campaign during 1954 was on the same lines as that of the previous year, but attention of the State Governments was drawn to two important factors. In the previous year, the cultivators were asked to use a seed-rate of 20 lbs per acre. But experiments conducted in the previous season with a lesser seed rate had shown that the quantity of seeds could be decreased without adversely affecting the yield of the crop. In a number of cases, a seed rate of only 10 to 12 lbs per acre was used, but the yield was as good as with the seed rate of 20 lbs per acre.

The State Governments were, therefore, requested to consider the desirability of advocating this practice to the farmers to see that it was adopted as far as possible. The other point concerned the production of paddy seedlings. The essence of the Japanese method was that the seedlings are produced for transplantation on specially raised seed-beds, which have to be properly manured and looked after. The cultivators might show reluctance in adopting the somewhat elaborate technique which this process involves. The difficulty might be overcome if production of seedlings on raised seed-beds was arranged at farms or plots of lands belonging to Government or selected co-operative societies, and seedlings made available to the cultivators at a reasonable price.

Another request made to the State Governments was to see whether the number of demonstration plots could be doubled in 1954.

The Union Minister for Agriculture, Dr. Panjabrao Deshmukh, inaugurated on March 15, 1954, the first anniversary of the campaign of the Japanese method of paddy cultivation with a broadcast talk. Dr. Deshmukh said :

"Today is the 15th March—in my view a great day because on this day last year we started an intensive campaign in favour of the Japanese Method of Paddy Cultivation all over India. Today is the first anniversary of this comparatively small but an epoch-making event, because by it hang my hopes of a regeneration of Indian agriculture. What little we have been able to do in the course of 1953 should, I feel convinced, initiate a new epoch in the history of Indian agriculture. A year back it was certainly a venture because there were many uncertainties attached to the campaign. We were not sure how many people will co-operate, what enthusiasm we will be able to generate and what degree of success we would attain. I am so happy to see that we have reason to be more than satisfied in all these respects because everywhere our expectations have been more or less realised and in many cases they are exceeded. Naturally enough there were doubts about its efficacy, and much more so its applicability to the varying conditions over the whole of India.

"As a mere enthusiastic scheme of the Government many people were hesitant to go in for it, quite a few more had a very strong objection to the name, and thought it derogatory to the antiquity and pride of Indian agriculture that we should have called it the Japanese method. After a lapse of a year, however, I can safely say that most of those who scoffed at it are now inclined to bless it because wherever they went the results have been so satisfactory. All the same, I thank them all for this change in their attitude. Now, that we have achieved this success, I am not at all sorry that we had some critics and a few opponents also. Their existence and their presistent criticism have proved conclusively that our endeavour was severely tested but was not found wanting.

"If I may quote from the leading daily journals—one from Nagpur and another from Bombay—it would be apparent what high expectations the success of the Japanese method has raised for the future.

"The Nagpur journal says :

'With the extension of the acreage under rice and with the provision of irrigation facilities a time should soon come when even the present imports from Burma, which are of the order of five to six lakh tons, could be reduced to a negligible figure. The State Governments should also take steps to cut down losses through attack by insects and pests and as a result of poor storage arrangements. While the above mentioned measures will collectively help to make India self-sufficient in rice, we believe that the extensive use of the Japanese method of paddy cultivation would be the best and quickest way of reducing the gap between demand and supply. Experiments carried out in different States during the past years show that the yield per acre can be increased ten-fold without much difficulty. In Madhya Pradesh, for instance, it was found that on some farms the rice yield increased from eight maunds six seers to as much as 117 maunds 15 seers per acre. India's rice acreage stands at 7,11,98,000. The area on which the Japanese method has been tried is just 2,60,000 acres. Every effort must now be made to increase this area and thereby reduce India's dependence on foreign supplies of rice, even though present rice imports be for the purpose of maintaining a rice reserve.'

"The Bombay paper commenting on 'decontrol' expresses itself as follows:

'If the expectations of the Bombay Government are to materialise, it should be possible to remove all controls on foodgrains by the middle of the year. In his budget speech Dr. Jivraj Mehta has stated that the revised estimate for rice production in 1953-54 is 12,95,970 tons. This means a 25 per cent increase in out-turn, as compared to the figure for the year 1949-50. When the Japanese method of paddy cultivation, which has proved its efficacy, spreads to the rural areas, there is bound to be a further increase in rice production in the State.'

"As my listeners know, we achieved these results without hardly any cost to the Central Government beyond preparation of publicity material. For want of our own films we had to use a film produced in Japan, but we did our best to give it the largest possible publicity. This year we are trying to tackle publicity, etc., a little more systematically. I have constituted a small committee at the Secretariat level which will co-ordinate the acti-

-vities in the various directions. Wherever old printed material is available, it may be used for the propagation of the method, but we are also producing a few new pamphlets and we hope also to show films prepared in India. I expect there will be some three films, which it would be possible for us to show round. I have requested my colleagues, the Ministers of Agriculture in the States, to utilise this day for broadcasting on the Radio and taking other steps for its publicity. But the 10th and 11th of April have been fixed for a still greater drive when I expect the largest number of people, including teachers, professors and social as well as political workers, to go into the rural areas where paddy is cultivated so that the largest number of people may know about it. In the meantime, of course, further demonstrations would be carried on. I have more than once expressed my admiration for the help we got from Kora Kendra people and the Gandhi Smarak Nidhi workers. They toured a large number of places last year and gave numerous demonstrations. The services of Shri Prannath Kapadia and Shri Harishchandar Patil who, in fact, brought this method to India, have been of the greatest importance. They have started training classes and demonstrations already.

"As I had pointed out previously, this method, which is essentially a more scientific method of better agriculture, is, in some respects applicable to other crops also. I am very happy to say that a large number of cultivators have taken this hint and some Agriculture Departments also have shown commendable enthusiasm. The result is that the success of the Japanese method in the case of paddy is being repeated with regard to other crops also with signal success. In order that we should expand the scope of these methods of better cultivation to other fields, I have proposed that the 15th of May should be celebrated as a day for intensive propaganda in favour of better cultivation of cotton, jute, *jowar*, maize, *bajra*, as well as *ragi*. The intention is that the Departments of Agriculture in the States should, as a result of this intensive drive, convey their advice on spacing, on seed-rate, on the amount and kind of fertilisers and manures to be used to as many cultivators as possible and persuade them to try the improved methods in respect of these crops on some portion of their area. We cannot obviously be content with more paddy, we also want more jute, more cotton, and more of other foodgrains and oilseeds.

"In my speech delivered at the Annual General Meeting of the Sugar Mill Owners' Association, I have promised to tackle the question of increased sugarcane production also. In order that we may leave no desirable step from being taken, I have also suggested the 15th of August for more intensive propaganda for better cultivation of the *rabi* crops, such as wheat, gram and oilseeds, etc.

"Last year the Central Government offered big loans to States for purchase of fertilisers by the cultivators. The Central Government has allotted a sum of Rs. 10 crores for advances as loans to various State Governments during the current year also. Sufficient advantage does not seem to have been taken of this facility, but I hope with the popularity of the Japanese method the States will avail themselves of the loans and pass them on to the cultivators to the largest extent possible. If this is done, the complaint that the Japanese method is costly need not be there. From the figures so far available from the various States, it is apparent that if some care is taken, the difference in the cost between the old method and the new method can be very appreciably reduced. Indeed, I have met a large number of paddy cultivators who are prepared to prove that, excepting probably the extra cost of chemical fertilisers, there is no reason to spend more for the Japanese than on the local method. Of course, the local method may be very inexpensive if the cultivators believe in merely throwing the seed and waiting for the miracle to happen. The comparison must be more or less between the same level of cultivation.

"The reports received also indicate very impressive results wherever the method has been somewhat systematically applied. Even taking all the States which have reported so far, the additional yield per acre comes to 15.7 maunds. It is significant to know that the additional average yield in Orissa was 17 maunds, in West Bengal 19.5 maunds, in Travancore-Cochin 21.6 maunds and in Madhya Pradesh 38 maunds. If we compare them with the previous averages, one is agreeably surprised with the most encouraging results obtained. For instance, in U.P. the maximum output per acre after adoption of this method has been reported as 18 maunds of paddy, which normally used to be 5 maunds 35 seers. In the case of West Bengal we have a report that 95 maunds per acre under the Japanese method was produced against the normal yield of 11 maunds. In Bombay and Madhya Bharat it reached

120 maunds, as against the usual yield of 8 to 10 maunds. Mysore, however, appears to have reached the record yield of 144 maunds, from the previous output of 7 maunds and 15 seers.

"I may again repeat that expert advice should be sought in the utilisation of chemical fertilisers. But a minimum dose of about 200 lbs per acre is not likely to do any harm in any case. Whether it should be ammonium sulphate or phosphate or any other mixture is for the Department of Agriculture to say for any particular area. Steps are being taken to see that chemical fertilisers are available not only by way of taccavi but also at prices as low as possible. I am happy to say that there has been good response in the utilisation of ammonium sulphate and chemical fertilisers. In some cases, a little too cautious a policy of the State Governments led to non-availability of adequate quantity at the right moment. I hope this experience will not be allowed to be repeated since people are now realising the value of the use of the fertilisers. May I again quote from a Calcutta paper :

"The data relating to fertiliser consumption after the adoption of the Japanese system also makes interesting reading. Reports indicate that in the first nine months of last year 2,12,754 tons of ammonium sulphate were consumed as against 1,89, 173 tons for the whole of 1952.'

"I have no doubt that there is immense scope for better paddy cultivation in India and if we sincerely do all we can, there is no earthly reason why we should be not only self-sufficient, but be in a position to export some of our better varieties to countries like Ceylon who have been our traditional customers. The talk about the soil having lost its fertility is, in my view, a totally false cry. But if it is at all true of any area, let us make an effort to put the fertility back into the soil. All that needs to be done is an honest continuous effort, and, as has now been demonstrated, a little effort is capable of paying very rich dividends. I gratefully acknowedge the co-operation, sympathy and support from all quarters, from the public, the Press as well as the honest peasant. It is for us who have realised the value of this method to carry it to a still larger number of people and to persuade them to practise it whatever portion of land they could set apart for this purpose.

"Another suggestion I have to make is in respect of the establishment of nurseries for preparation of seedlings according to the Japanese method. It may be tedious and troublesome for every small cultivator to take all the pains for preparation of the seed-bed and the seedlings according to the Japanese method, but I think the officers of the Departments of Agriculture, the village panchayats and the public workers may probably be able to encourage the preparation of these seedlings by selected cultivators in a village or even a group of villages so that others may be able to purchase them. I have already made this suggestion to the State Governments but I would like it to be known as widely as possible. Indeed, there have already been instances where people who could spare some of their better seedlings have sold them to others and made good profit. In my view it is wrong to belittle the importance of the raised and properly prepared seed-bed and the strong and healthy seedlings it produces.

"Knowing the high seed-rate in India, we had recommended a cautious seed-rate of up to 20 lbs per acre. We are in a position now to say that almost nowhere the seed-rate need exceed 10 lbs per acre, and this is a fact of very vital importance, as everyone knows our stocks of good seed are limited. If we utilise the available quantity of good seed at the rate of 60 to 150 lbs per acre, it would cover only a small portion of our area. If, on the other hand, we could resort to the Japanese method on a large scale, our good seeds will go from 10 to 15 times as far and would also yield more healthy seeds for the next year.

"Lastly, I would like to appeal to all concerned to kindly note the dates and the programme which have been set out and to help the popularisation of better methods of agriculture as a whole throughout the country in such a manner as may be within the capacity of each individual citizen of India."

CHAPTER V

WORK IN THE STATES

The campaign for the Japanese method of paddy cultivation, launched by the Government of India, has been tried in various States with varying degrees of success. In most of the States, however, the results have been uniformly good.

Here, the progress of the campaign in some of the major paddy-growing tracts and the results achieved are given State-wise.

ANDHRA

The Japanese method of rice cultivation, modified to suit the conditions of the State, was inaugurated on March 15, 1953 (in the composite Madras State) at the instance of the Government of India. Being the first year of introduction, no targets were fixed at that time. The Extension Wing of the Agricultural Department carried out vigorous propaganda for the new method and the benefits accruing therefrom. A few enthusiastic ryots took up the method advocated by the Department as an experimental measure during 1953-54 season, and there was a fair amount of appreciation on their part of the efficacy of the method in increasing paddy yields, based on the results achieved. The main features of the Japanese method adopted during 1953 were :

(a) reduction in seed-rate to enable the growth of robust seedlings ; (b) use of good and treated seed, (c) line planting ; (d) use of super-phosphate (100 lbs) and half the dose of sulphate of ammonia (50 lbs) before puddling ; (e) use of balance of ammonia sulphate (50 lbs) at the time of first weeding, *viz*., 6 weeks after transplantation ; and (f) raking with a hand rake at the time of weeding two or three times at a fortnight's interval.

During the year 1953-54, 2,466 demonstration plots were laid and 884 villages were covered in the Andhra State. The propaganda material such as flipbooks, flannelgraphs and pictorial posters, received from

the Indian Council of Agricultural Research were made available to district staff for demonstration and propaganda in villages. Slides showing the Japanese method of rice cultivation were exhibited in places wherever facilities existed. Sesbania seed packets, on which hints on the modified Japanese method to suit local conditions were printed, were distributed to the ryots on a large scale. Some fabricators also started manufacture of small hand rakes, costing less than a rupee, for facilitating easy stirring of the soil. There was good demand for this implement. As a result of the propaganda and efforts made by the Department, the total area covered during the year in the Andhra State under the Japanese method was 6,936 acres.

At the instance of the Indian Council of Agricultural Research, randomised, replicated trials were conducted in cultivators' fields in East Godavari, West Godavari, Kistna and Nellore districts. The trials were financed by the Indian Council of Agricultural Research. Experiments were also laid out on Agricultural Research Stations at Maruteru, Samalkot, Buchireddipalem and Bapatla. Results at these research stations have not been uniformally satisfactory. The results at the College Farm, Bapatla, were not good, while those at Anakapalle and Samalkot, were encouraging. At Maruteru, MTU-1 was tried with a heavy dose of nitrogen, but this variety could not withstand the manuring and there was ledging. The results could not, however, be judged in proper perspective with the experience gained during one year.

Though appreciation of the new method among the ryots was not universal, many of them, particularly in districts like Chittoor, Srikakulam, Anakapalle, Cuddapah, Anantapur, etc., realised the importance of the method and the various measures adopted for increased yields during the year. On an average, it is estimated that the Japanese method gave an increased yield of 700 lbs per acre or 4½ bags, as compared with the normal average yield of 10 to 12 bags in the non-Deltaic areas. Though the results obtained were actually spectacular in certain areas (upland and non-Deltaic areas under lift irrigation), they were not uniformly encouraging throughout the State, particularly in the Deltaic areas.

In view of the favourable response from all over the country during 1953-54, the Government of India fixed a target of 20 lakh acre to be covered by the Japanese

method for the country as a whole, and allotted 1.50 lakhs of acres for the Andhra State, and requested the State Government to take adequate steps to introduce the improved method within the area fixed for the State. This target, though very high, was accepted by the State Government, and necessary arrangements were made by dividing it district-wise. The district agricultural officers were instructed to follow the directions given in the note prepared by the paddy specialist. Instructions were issued to the district staff to get the leaflets translated into Telugu and printed for large-scale distribution in the districts. They were advised to advocate the adoption of the lower seed-rate and raising of large-scale paddy nurseries on plots belonging to seed-farm ryots, or selected co-operative societies so that the seedlings of the proper type were made available to cultivators at reasonable price. The various steps taken by the State Government to popularise the method during 1954-55 are detailed below :—

(i) Conducting propaganda meetings during the year throughout the State ; the total number of meetings so conducted up-to-date was 10,576 ;

(ii) distributing literature and flannelgraphs ; bulletins on "Paddy Yield the Japanese Way" (English) and bulletins on "Japanese Way" (Hindi) and leaflets on "Growing Paddy the Japanese Way"(English) ;

(iii) exhibiting film on "Japanese Method of Rice Cultivation" (English) received from the Indian Council of Agricultural Research ;

(iv) supply of seeds and manures on loan ;

(v) large-scale distribution of leaflets printed in Telugu with the funds made available from the Collector's Discretionary Grants ;

(vi) conducting a large number of demonstrations throughout the State ; (the number of demonstration plots laid in cultivators' fields and Government farms up-to-date are 14,843) ;

(vii) combining the cultural practices of the Japanese method with the fertiliser demonstration trials. The fertilisers were supplied by the Indian Council of Agricultural Research to popularise the Japanese method on as large a scale as possible ;

(viii) utilising the funds available with the National Extension Service and Community Development Blocks in certain areas for subsidising the distribution of inter-cultivating implements; and

(ix) making available a large number of Rotary push hoes and hand rakes from the Agricultural depots for demonstration purposes and for sale and distribution to ryots.

During the year 1954-55, too, randomised replicated trials were laid out in cultivators' fields in all the districts of the State with the financial assistance of the Indian Council of Agricultural Research. In addition to this, experiments were laid out on Government farms at Meruteru, Samalkot, Anakapalle, Buchireddipalem and Bapatla to test the efficacy of the method *vis-a-vis* the local practice.

The district agricultural officers had been instructed to maintain close touch with the crop and plant protection officers so as to ensure prompt and adequate attention to pests and diseases in the districts, while keeping sufficient quantity of pesticides and insecticides in each taluk.

As a result of the adoption of the above measures during the year for the popularisation of the Japanese method, the following progress was achieved up to the fortnight ending February 15, 1955 :

(a) Area raised under improved seed beds, 5,175 acres; (b) area transplanted, 40,964 acres, and (c) number of villages covered, 9,874.

The following difficulties were experienced by the Department in the popularisation of the method :

(i) Though 1954-55 was only the second year of trial of the Japanese Method of Rice Cultivation (and the first year for fixation of targets), a target of 1,50,000 acres was fixed for this State. This is very high, particularly in view of the fact that the method had not gained sufficient publicity and popularity in the districts during the first year of its introduction. Unless any improvement is ordinarily demonstrated for two to three years in the ryots' fields and its efficacy over the local method proved beyond doubt, ryots do not, on their own initiative, take to the new method.

In the absence of this, the departmental staff had to attend to the planting and popularisation in most of the areas and it was, therefore, not possible to achieve better progress with the staff available ;

(ii) In the Delta districts of Krishna, West Godavari, Guntur and East Godavari (to which a major portion of the target was assigned), the planting season is very short and within this period a larger area could not be covered with the available staff. Further, there was labour scarcity during the period, and as the existing labour is still not trained in "planting-in-lines", the ryots feel that the adoption of the method involves inconvenience and higher costs. In the other districts, where the planting season is more spread out, better progress has been achieved.

(iii) The south-west monsoon was received late in some districts like Srikakulam, Anakapalle, and Nellore and was almost a failure in Anantpur district. In view of this, transplanting had to be done in a hurry during September-October and many overgrown nurseries were even abandoned and broadcasting resorted to, particularly in Nellore district. In Anantpur district, water was available only in October in many tanks and the progress was, therefore, necessarily poor due to unwillingness on the part of ryots to risk experimenting new methods under adverse seasonal conditions. Further, nearly 50 per cent of the area under paddy in this district is broadcast.

(iv) The method did not give uniform results in all the districts of the State. It has given undoubtedly increased yields in lighter and well-drained soils (mostly tank-fed and well-irrigated areas) under lift irrigation and early planted conditions. In Deltaic areas, the application of nitrogen even at low levels, resulted in rank growth and did not result in any perceptible increased yields.

In view of the above facts, it was not possible to achieve better progress during the year 1954-55.

The following measures are proposed for widespread propagation of the method in the ensuing seasons :

(a) With the experience gained in the State on the various items of improvement advocated in the method, suitably modified demonstrations have to be laid out on a large scale to convince the ryots in the different tracts of the State of the efficacy of the new method.

(b) The targets have to be enhanced for the districts where the method has resulted in definite increased yields.

(c) The method has still not gained popularity in the Deltaic areas. Before a large-scale promotion of the method can be advocated in these districts, it is necessary to lay out replicated experiments to assess the real value of the method under such conditions. The result of trials laid out during 1954-55 are not yet available, and it may be necessary to conduct such trials, even during 1955-56, before suitable and authoritative suggestions can be given with confidence for Deltaic areas. It is, therefore, necessary to exercise a certain amount of caution in fixing targets for Deltaic districts and restrict the same to a reasonable figure.

In the Japanese Method of Rice Cultivation, the main points to be ensured are (i) raising of proper seed-beds, (ii) line planting, (iii) heavy manuring, and (iv) inter cultivation. While there is no difficulty in raising improved seed-beds and in ensuring adequate manuring, some difficulty is still experienced in making the ryots adopt line-planting, and timely and frequent inter-cultivation. Ways and means of overcoming the difficulties experienced in line-planting are being devised.

Inter-cultivation is, however, a difficult problem for an ordinary ryot, who is not able to provide himself with a push hoe which costs about Rs. 20. For this purpose, it is necessary for the Agricultural Department to stock a large number of push hoes for demonstration purposes, and hire them out to the ryots at a nominal rate of about 2 annas per day during the reason. Unless inter-cultivation is done, it would not be possible to make the ryots realise fully the benefits of the new method, as line-planting and

heavy manuring will not by themselves give increased returns. It may also be necessary to subsidise the sale of implements (push hoes) in certain areas.

(d) Intensification of propaganda on the lines already adopted by making available more pamphlets and literature. The 16 m.m. film in English on Japanese Method of Rice Cultivation may be dubbed with Telugu commentary and one copy provided for each district. This will go a long way in making propaganda effective.

(e) There are no propaganda vans in the Department at present and considerable difficulty is being experienced in projecting 16 m.m. propaganda films. It is necessary to exhibit such films in all the villages (especially in the interior villages) in order to be able to stimulate enthusiasm for the new method. Propaganda vans suitably equipped with projector etc., will be of great value in quickly and effectively reaching all villages and popularising the new method. In fact, such audio-visual aids are necessary for normal propaganda work of the Department. At present we do not have even one such van. While one such van per district would be of immense value for effective propaganda work, it would be desirable to have at least four vans for the special purpose of propagating Japanese Method of Rice Cultivation, one for each of the Regional Deputy Directors of agriculture to cover three districts each, including Araku Valley, which is under a special district agricultural officer, as a first step in this direction. It would be appropirate for the Government of India to finance this proposal. A fully equipped van may cost roughly Rs. 50,000/-.

(f) As the manuring of paddy crop in the puddle (before transplanting) is advocated in the Japanese method it is very necessary to supply chemical manures through loans during April. It may, therefore, be necessary to arrange for the issue of taccavi loans for the purchase of seeds and manures, and Intensive Manuring Scheme loans for the purchase of fertilisers from May onwards, instead of from July as obtaining at present.

(g) As the complex experiments to test the merits of the Japanese system of paddy cultivation being financed by the Indian Council of Agricultural Research at Coimbatore, Nagina, Karjat and Cuttack may not be useful to this State, it has been suggested that an experimental station, financed by the Council, may be located in Andhra State also, in view of the fact that this State is predominantly a paddy-growing area.

(h) The question of awarding prizes to departmental workers engaged in the campaign for adoption of the Japanese method was considered previously. In October 1953, the Madras Government informed the Indian Council of Agricultural Research that such an arrangement was not necessary due to certain reasons. This Government felt that award of prizes to departmental workers will create enthusiasm and initiative on the part of the departmental workers who are mainly responsible for the popularisation of this method.

ASSAM

The Japanese Method of Paddy Cultivation was introduced in Assam in 1953-54, at the instance of the Government of India. A Statewise campaign was launched in April, 1953, with the appointment of a campaign officer to conduct the State campaign.

In the initial stage of the campaign in 1953-54, training centres were organised—one at the Kahikuchi Farm in Kamrup district, another at the Rarbheta Cachar district—to impart training to the officers of the Department as outsiders. The training was initially imparted by the campaign officer to the officers of the Department of Agriculture, who, in turn, gave training and practical demonstrations to the demonstrators of the Department and to the cultivators in their respective circles.

In order to popularise this campaign, ammonium sulphate and improved seeds, which help considerably to increase the average yield per acre, were supplied to the poor cultivators at reduced rates and also on half-cash and half-loan basis. This was the first time in the history of Assam that

determined efforts were made to popularise artificial fertilizers for the paddy crop and to make the people fertilizer-minded, so that the yield of crops could be increased through the Japanese Method of Paddy Cultivation. The Agricultural Department organised about 3,000 demonstrations in all the districts to popularise this method. A quantity of 1,461 tons of ammonium sulphate were obtained from Sindri during 1953-54 and distributed to the cultivators. This was expected to benefit an area of 30,000 acres.

As it was found difficult to realise payments from the cultivators, the concessional issue of seeds and manure on half-cash and half-loan basis was withdrawn during 1954-55. A quantity of 2,800 tons of sulphate of ammonia was indented for from Sindri Fertilizers Co. Ltd., Calcutta, for the year 1954-55, but 2,472 tons were actually received and distributed to the cultivators. This covered an area of 53,395 acres. The demands for fertilizers had increased, but due to the extensive breaches on the Assam Link Railway, a large number of wagons were held up around Siliguri. The non-arrival of fertilizer stocks dampened the efforts of the State to see the campaign through.

The efforts for increasing the overall food production through the Japanese Method of Paddy Cultivation were also seriously affected during the period 1954-55 owing to the devastating floods of 1954-55. The food crops in most of the low-lying areas in all the plain districts of the State were adversely affected.

Altogether, 4,933 meetings were held during 1954-55, at which the Japanese Method of Paddy Cultivation was explained to cultivators in as many as 1,551 villages. Those who followed the method obtained in a large number of cases more than double the yield from their paddy field.

In Moamari village, near Dibrugarh (Lakhimpur district), about 360 acres were put under the Japanese Method of Paddy Cultivation. Shri Ananda Datta obtained 110 maunds 15 seers of paddy and Shri Kumand Hasarika obtained 98 maunds 12 seers per acre. The average yield of paddy crop under the Japanese Method of Cultivation was 70 maunds per acre, against 30 maunds per acre obtained

by the local method. The cultivators were obviously happy to reap the rich harvest, and the demand for fertilizers was reported to be higher than that of the previous year. Vigorous propaganda is being carried out in the State by the Department of Agriculture to induce the cultivators to take up the Japanese Method of Paddy Cultivation, thereby increasing the overall production of paddy.

Regarding the programme for 1955-56, the State Government proposes to continue the campaign vigorously as before. A target of 1,00,000 acres has been fixed for the Japanese Method of Paddy Cultivation in 1955-56, and every effort is being made to persuade the cultivators to follow the method. The district officers have been directed to mobilize their staff to the maximum possible extent to achieve the target.

BHOPAL

Bhopal is not a big rice-growing area. The total area under rice is about 32,192 acres, out of which only about 2,000 acres are under transplanted paddy, where the Japanese Method of Paddy Cultivation can be completely adopted. In the rest of the area, only the partial method, such as the treatment of seed, introduction of low seed-rate and application of fertilizers, can be adopted.

It may be mentioned here that the entire area in Bhopal, transplanted or otherwise, is purely rainfed and as such is susceptible to the vagaries of the monsoon. In spite of this, the first year's campaign was quite a big success.

An intensive campaign for popularising the Japanese Method of Paddy Cultivation was launched in Bhopal State on March 15, 1953. A meeting of a large number of cultivators was arranged on that day in Bhaunri, an important rice-growing village, in a Community Project area. The meeting was attended by most of the field staff of the Community Project and Agriculture Departments. The technique, necessity and advantages of the Japanese Method of Paddy Cultivation were impressed upon the large number of cultivators who had attended the meeting.

After launching the programme, intensive work was undertaken by the field-staff for educating the cultivators regarding the method through the use of various types of

publicity material received from the Central Government, such as posters, flannelgraphs, and flip-books. The field staff of the Agricultural Department, Community Project and Ford Foundation Project held meetings in different villages and explained to the cultivators the advantages of the Japanese Method of Paddy Cultivation, and also selected 200 demonstration plots (about 100 acres) in representative areas.

These demonstration plots were under the supervision of the village-level workers and *kamdars*, who had been trained thoroughly in the technique ot the new method. The results of the first year's efforts were very promising and the highest yield was 63 maunds 30 seers per acre, never before attained in the area. The other yields, though not as high, were 100 per cent above the normal yield of the State.

Representative cultivators from all over the State were also taken to the best demonstration plot and shown round.

During 1954, nearly 600 acres were put under the complete Japanese Method of Paddy Cultivation and the rest under the partial method. The target for 1954 was, however, 3,200 as fixed by the State Government, as against 10,000 acres proposed by the Central Government. The target of 3,200 acres could not be achieved as the tank which was to supply water for paddy cultivation to a considerably big area had breached and no water could be stored.

The Bhopal cultivator is more than convinced about the success of the Japanese Method of Paddy Cultivation, but, unfortunately, due to the uncertain rainfall, he has not been able to increase his area under this method. The obvious difficulty confronting the normal progress of the campaign is, therefore, lack of assured water supply. The difficulty is also being surmounted by the State Government by bringing new areas under paddy cultivation in tracts commanded by the irrigation projects which are complete or are under completion. Seed treatment and low seed-rate have caught the eye of the cultivators and are being practised throughout the State.

Bhopal State is doing all it can to make this campaign a success.

BIHAR

The gross area under cultivation in Bihar is over 27 million acres, out of which 13.9 million acres are under paddy alone. Though Bihar is mainly an agricultural State, it has been often deficit in food production. Therefore, the suggestion of the Government of India to start paddy cultivation by the Japanese method, as practised at Kora Kendra, was readily taken advantage of, and a small beginning was made in 1952-53.

In order to ensure adoption of the Japanese method by as many progressive growers as possible, targets for conducting 425 demonstrations on plots of half an acre each and an area of three thousand acres were fixed to be covered by the Japanese method. Apart from the posters and pamphlets received from the Govt. of India, 17,000 copies of the leaflets describing important features of the methods and giving practical hints to the farmers were distributed as widely as possible, Six film strips and 9 films on the Japanese Method of Paddy Cultivation were purchased and handed over to the Public Relations Department of the State for holding shows in the villages. Over one thousand meetings of paddy-growers were held in the villages explaining the new method of cultivation and exhorting them to adopt it in their paddy fields.

Before the commencement of the main season, demonstrations of the new technique were given in all the Government farms, where prominent cultivators of the area were invited along with the Extension staff in the villages. Provision for a free supply of fertilisers for these demonstrations was made and 60 rotary hoes and 60 hand-pans were supplied to the staff of the Agriculture, Department, Community Projects and National Extension Service Blocks to demonstrate their use.

The main features of the Japanese method, recommended in Bihar during the first year of its introduction, are given below :—

1. Selection of good seeds and reduction in seed-rate to 10 seers per acre.
2. Raised and manured seed-bed.
3. Transplanting seedlings 10 inches apart in lines, with 2 to 4 seedlings per hole.

4. Adequate manuring of paddy-land with 100 maunds of compost and one and one-fourth maunds of ammonium sulphate and one and one-fourth maunds of super-phosphate per acre at the time of transplanting, followed by a similar application three weeks after the transplanting.

5. Ensuring sufficient water supply to the crop.

6. Three to four weedings with Rotary hoes after every fortnight before flowering.

The drive to introduce the recommended method was launched from the middle of March, 1953. Four hundred and twenty-five demonstrations were conducted in cultivators' fields and an area of 3051 acres was covered by the new method. About 50 per cent of the cultivators adopted all the recommendations and the rest could adopt it only partially, limiting it to manuring, transplanting and weeding.

The growth of the seedlings was vigorous. Tillers of of the crop ranged between 30 to 100 as against 8 to 20 in ordinary transplanted crops. The average yield came to 40 maunds paddy and 100 maunds straw per acre, whereas the ordinary crop yielded 15 maunds of grain and 30 maunds of straw per acre. Yields as high as 112 maunds of grain and 250 maunds of straw per acre were obtained by a few cultivators. The average cost to cultivator by the Japanese method come to Rs. 200 against Rs. 100 in the case of the ordinary method. The net profit per acre from the crop grown by the Japanese method was Rs. 100 on an average. There were quite a few cases where the net profit rose as high as Rs. 250 per acre.

Encouraged by these results of the first year's drive a further intensive drive was launched in the year 1954–55, particularly in the areas which had got facilities for irrigation. A target of five lakh acres was set for the entire State, and it was decided to conduct 7,450 half-acre field demonstrations. The Community Project and National Extension Service Block staff took up this work in their respective areas. Elsewhere, the Agriculture, Revenue. Gram Panchayat, Co-operative and Public Relations Departments pooled their resources together for propaganda and demonstration work. Credit facilities for the supply of fertilisers were offered. Instructions were issued to intensify the drive to popularise the Japanese Method of Paddy Cultivation.

Subsequently, however, the target for the year to be covered had to be reduced to two lakh acres due to natural calamities such as failure of rains that overtook this State. Taking advantage of the experience gained in the first year, further modifications in the seed-rate were made. The seed-rate was reduced to six seers per acre and spacing was increased to 12 inches and the number of seedlings was reduced to two to three per hole. A Hindi leaflet incorporating this was issued for the guidance of the cultivators; 75,000 copies of this leaflet were distributed, and 8,582 meetings of paddy-growers were held explaining the Japanese method. Demonstrations and rehearsals were organised well in advance of the main growing season in all the police stations for practical training of the staff of different departments and prominent growers. Over 400 rotary hoes were purchased and sold to cultivators; 17 weeders, 12 films and 4,000 leaflets, which were received from the Government of India, were distributed or shown to the public. Local manufacturers of agricultural tools were encouraged to manufacture these hoes which were purchased by quite a large number of farmers.

These measures resulted in the organisation of 8,359 demonstrations on plots of half-an-acre each, and an area of 44,725 acres in 8,244 villages was covered under this method, despite the heavy odds due to the failure of rains and recurrence of floods in North Bihar, in addition to drought which the cultivators had to face. Out of the 22,000 tons of fertilisers used in the State, the Japanese method alone accounted for 8,000 tons.

Although tillering showed a decline during the year under report due to adverse circumstances, still it has averaged around 25, and the highest tillering was recorded at 80. Reports indicated that there were quite a large number of cultivators who had obtained yields higher than 40 maunds per acre as against 10 maunds per acre, which meant that the adoption of the Japanese method had resulted in an extra production of 4,47,250 maunds of grain.

It has been found that the seed-rate could be usefully reduced to 5 seers per acre and that the increase in spacing to 12 inches per hole at transplanting was helpful in facilitating interculture and manuring without any adverse effect on the number of shoots per clump. A 10-inch spacing for early varieties and 12-inch spacing for late ones may be the desired thing to be adopted. It has also been found that the cost of labour goes down as the people get accus-

tomed to transplating in lines and adopt other features of the method.

Past experience in organising an intensive drive has shown that there is good scope for improvement.

BOMBAY

The Japanese Method of Paddy Cultivation was first tried during the 1952-53 season at the Agricultural Research Station, Karjat, and the Government Agricultural School, Kosbad, in comparison with the local method.

This method was tried by the Kora Gramodyoga Kendra and by a few progressive farmers who secured encouraging results in the Bombay State. In this method, as more emphasis is laid on higher doses of fertilisers, it was recommended only where sufficient water supply is assured.

The campaign to popularise this improved method was initially inaugurated by Shri Bhau Saheb Hiray, Minister for Revenue and Agriculture, Bombay State, on March 18 1953, at Annapurna Farm, Pawai, near Thana where more than 3,000 cultivators in the district had gathered and showed keen interest in the campaign.

Shri H.G. Patil, who was deputed to Japan to specialize in rice cultivation adopted in that country, was appointed as Officer on Special Duty to supervise the work of the scheme. The scheme was started on April 1, 1953, and made applicable to 18 important paddy-growing districts, in the first instance, which had sufficient and assured water supply. In the next season, it was extended to all the suitable paddy-growing tracts in the Bombay State.

Propaganda Meetings : To give impetus in launching the scheme, the Director of Agriculture as well as the Joint Director of Agriculture (Extension), toured the districts and explained the working of the scheme at the joint meetings of the district development boards, social workers and prominent cultivators, which created great enthusiasm among the farmers to take up this improved method. The Officer on Special Duty took every opportunity of touring the paddy-growing tracts in the interior of the State and explained the scheme to the cultivators as well as to the extension staff by giving practical demonstrations, such as preparing raised bed, transplantation in

rows, inter-culturing, etc., wherever possible.

Training Classes : Training for the Japanese method was arranged for departmental workers, cultivators and non-officials at 14 rice research stations in the State. A long-term course of training for 6 months was specially arranged at the Agricultural Research Station, Karjat, for the benefit of the trainees outside the State. This training proved useful by way of creating confidence among the Extension staff who are responsible for diffusing the knowledge of this improved method of cultivation of the farmers in the far-off villages.

The working of the scheme consisted of two aspects : (1) Organisation of demonstration plots on guarantee basis in the fields of cultivators ; and (2) adoption of improved method of cultivation as a result of popularity and propaganda.

Demonstration Plots : Demonstration plots of average size of 10-15 *gunthas* were organised in the fields of cultivators in all paddy-growing tracts of the State on a guarantee basis. This proved attractive. The demonstration plots constituted the preparation of raised seed-beds, sowing in lines, transplanting in straight rows, application of adequate quantities of manures and fertilisers and inter-culturing. These demonstrations helped promote the improved method by rousing keen interest among the cultivators attending it. Data showing the superiority of the Japanese over the usual method were also collected.

Tagai Loans : In order to accelerate the work of the scheme, the Government granted *tagai* loans, both in cash and kind, at Rs. 70 per acre in the case of the ordinary method and Rs. 125 per acre for the Japanese Method of Paddy Cultivation. Allotments of *tagai* advance have been kept at the disposal of the collectors and chairmen, district development boards, and the district agricultural officers are extending all possible facilities to make the loans available to the needy cultivators in time. Arrangements were also made to stock improved strains suitable to the tract at various depots in the districts and to distribute them to farmers on credit in the form of *tagai* and on cash basis.

Supply of Manure : Similarly departmental depots were organised in the district for supply of manure mixture to the farmers in the form of *tagai* and on cash basis.

Subsequently, the distribution of manure mixture was entrusted to agents appointed in the districts since 1955. Leaflets were also printed in regional languages to accelerate the green manuring drive.

Different doses were prescribed for non-laterite soils and laterite soils. Though the maximum dose was prescribed, the cultivators were advised to reduce it, according to the nature of the crop, availability of water and local conditions.

The Extension staff of the Department was instructed to carry on propaganda to popularise use of bonemeal in the paddy fields, especially in the laterite tract. Three small bone-digesters have been installed by the Sarvodaya Kendra, Ratnagiri, in the laterite tract, and these are preparing and supplying bone powder to adjoining cultivators for the paddy crop.

Seventy-two trial plots were laid out on the cultivators' fields during 1954-55 in 6 districts of important paddy-growing area.

As paddy crop requires adequate quantity of organic manure besides fertilizers and as there is dearth of adequate quantity of organic manure, the cultivators were advised to grow green manuring crop like *sannhamp* and *dhaincha* in the paddy fields and bury them while puddling. This practice is spreading as a result of propaganda done by the Extension staff of the Department. Arrangements were also made to supply the seed of green-manure plants to the farmers. In addition, demonstration owners were supplied with 1,500 lbs of *sesbania speciosa* seed free of cost by a Madras firm.

It is proposed to supply *glyricidia maculata* cuttings as well as seed to the demonstration plot owners from the Agricultural Research Station, Karjat, and the Agricultural School, Kosbad.

Interculturing Implements: Interculturing of the paddy crop helps to stir the soil, remove weeds and stimulate growth. Suitable implements for different tracts are recommended by the Department.

The Agricultural Engineer to the Government has prepared three types of hoes to suit the soil conditions—one is "Korjat hoe" and the other two are called "Rotary hoes". Arrangements have been made by the Agricultural

Engineer to manufacture them on a mass scale for supply to the farmers through the Extension staff. The demand for hoes is increasing. Besides, private firms and some local blacksmiths have succeeded in designing and manufacturing different types of hoes to suit local requirements. The Japanese type of hoe, which is manufactured by private firms, is also becoming popular among paddy growers.

Trials have been undertaken by the Agronomy and Engineering Sections of the Department to find out the efficiency and usefulness of these four types of hoes. From observation and experience, it is seen that the Japanese hand hoe is superior to other types of hoes.

Plant Protection Service : The staff of the plant pathologist and entomologist to the Government is rushed to the fields, whenever occurrence of disease and pest is reported. Demonstrations of control measures were given to the Extension staff and cultivators, and arrangements made to supply fungicides, insecticides and appliances.

A crop protection circular was issued to the Extension staff to conduct publicity for getting paddy seed treated with fungicides and spraying the crop at a later stage to prevent the disease.

The Pathology Section has undertaken fungicidial treatment experiments for prevention of paddy diseases at the agricultural research stations, Khopoli and Mugad, in 1955-56. The results are awaited.

Shibirs for cultivators, social workers, primary teachers, village officers, like patils and talathies, were organised by the Extension staff of the Agricultural Department at taluka places in the paddy growing districts. Practical training in preparing the raised seed-bed, compost-making, selection of seed, etc., was also given. These *Shibirs* effectively promoted the improved methods in far-off villages.

In the agricultural shows of important paddy-growing districts like Thana, Kolaba, Ratnagiri, Kolhapur, Surat, etc., field demonstrations were arranged at prominent places in the exhibition grounds, convincing the cultivators about superiority of the Japanese method.

A scheme for appointment of social workers or progressive cultivators of important paddy-growing talukas for carrying out intensive propaganda about the Japanese method, has been provisionally sanctioned by the Government for 1955-56 in order to extend it to the largest possible area. The Government has also directed that the holidays to primary schools should be arranged in such a

way that school children and teachers can help the cultivators in the agricultural operations.

To give further impetus to the drive, the Government has sanctioned a scheme for the award of prizes in 110 paddy-growing talukas of the State at Rs. 150 per taluka—one prize of Rs. 75 to the village which brings the largest percentage of area under the Japanese method, and three prizes of Rs. 25 each for the three highest yields of paddy. This is in addition to the general taluka level crop competition.

It has recently been proposed that some holdings should be put completely under the Japanese method, wherever suitable conditions exist. It is anticipated that there will be good progress during the year 1955-56. Further, whenever irrigation facilities and other favourable conditions exist, it is proposed to put the entire paddy area of the village under the improved method.

Some Experiments : In Kolhapur district, dibbling the paddy seed at regular distances and later interculturing both ways were found suitable, instead of drilling. The field was prepared and the seeds dibbled either just before the monsoon or with the first shower. Marking was done by an implement called "Yadtang" on both ways, and five to six seeds were dibbled and covered with compost. The distance kept was either 12″ x 12″ or 10″ x 10″ or 9″ x 9″. Later the crop was intercultured three to four times, according to the condition of the field. The crop was irrigated as and when necessary during the growing period. The dibbled crop gave better yield than the drilled one and there was also saving in the cost of cultivation. This improvement is becoming popular.

The possibilities of introducing the Japanese method in the Vaingan paddy is great, as there is assured water supply. Hence 137 demonstration plots have been organised in the Kolaba, Ratnagiri and North Kanara districts during the summer season of 1954-55.

Demonstrations were also arranged to grow Nagli seedlings without burning rab and, later on, transplanting in straight rows at regular distance and interculturing by small wooden ploughs or interculturing hoe. This gives profuse tillering and good yield. Such demonstration plots were arranged in Thana, Nasik, Kolaba, Ratnagiri, Kolhapur, North Satara, etc.

The crosses in the Japanese types are under study in 73 generations at the Agricultural Research Stations at Karjat, Mugad and Igatpuri.

Work done under the Scheme for Intensive Cultivation of Paddy by Japanese Method in Bombay State in 1953-54 and 1954-55 and Programme for 1955-56.

Item	1953-54	1954-55	1955-56
Area under Japanese Method (in acres)	6,930	92,636	1,50,000
Number of Demonstration plots	3,498	6,513	7,500
Number of propaganda meetings	3,200	14,905	
Higher yield obtained (lbs. per acre)	9,600 in West Khandesh district	14,240 in Kolhapur district	
Tagai given	Rs. 32,55,390	Rs. 15,45,247	Rs. 25,00,000
Number of Intercutting implements	3,450	2,271	
Copies of Brochures	1,50,000	1,30,000 34,000 1,64,000	
Average yield per acre (in lbs.)	3,477	3,483	

COORG

Nearly 30,000 holdings in Coorg are dependent mainly on paddy cultivation, and it is thus of supreme importance.

During the year 1953-54, 933 acres were brought under the Japanese Method of Paddy Cultivation, as the campaign was launched rather late in the season. In 1954-55, the area covered was about 11,000 acres, against a target of 10,000 acres assigned by the Centre.

The campaign was modified to suit the requirements of the conditions existing in the State, and it popularised three measures—selection of seed and reduction in seed rates, introduction of better implements such as iron ploughs and rotary hoe sand need for better manures. By reducing the quantity of seed employed, many farmers saved the value of seed paddy equivalent to the annual assessment of their land.

Nitrogen combined with superphosphate gave consistently better yields, and mixed manures have thus become popular.

The superiority of the Japanese method can be judged from the comparatively higher yields which commensurate with the cost of cultivation. Under the auspices of the Krishi Yuvak Sangh (4-H Clubs), every student member has been asked to follow the new method in his holdings in small plots.

Of the total area of about 97,000 acres under rice crops, the Japanese method can be followed only in areas where there is assured supply of water and where the ryots are to some extent economically well-off.

DELHI

Delhi State had an acreage of 500 only under paddy during the year 1951-52. Inspired by the publicity of the Japanese method of paddy cultivation, the State Agricultural Department decided to increase the area to 3,000 acres. Immediately all possible methods of extension were adopted for giving it wide publicity among the cultivators of the State, but in order to achieve this target, availability of more water was necessary.

Accordingly, the Canal Department was requested to increase the water supply during the monsoon season by

giving temporary shoots, but even these were given to cultivators who had been granted additional water supply during the previous year. This lack of water facilities stood in the way of the responsibilities which the Department had undertaken.

The machinery of the Agricultural Department, however, made the best use of existing resources. The village level workers were addressed by the agricultural officer on the method and its utility. Demonstrations and exhibitions to explain this were also arranged at important functions and exhibitions during the period. Sixty nurseries were sown to demonstrate this new method.

Seed supply. The paddy seed was distributed as follows :

Variety	*Quantity*
21 Up	92 maunds
Johna 349	20 seers
Basmati 170	20 seers
N.P. 97, 125, 130 & 137	32 seers

Arrangements were also made for the supply of 100 maunds of deep water paddy, which was utilised in the Najafgarh Lake area, an ideal place for the cultivation of this variety of paddy. To regulate the excessive water of the lake, a new regulator has been constructed.

Increasing demands of cultivators for supply of ammonium sulphate were also met with.

In 1954, 410 acres were sown under the Japanese Method of Cultivation but it is certain that as the cultivators have been convinced of the superiority of the method, the area will have expanded this year.

HIMACHAL PRADESH

The Japanese Method of Paddy Cultivation was introduced in selected areas of the State for the first time in 1953. As this practice was new, practical training was given at Government farms and other important centres.

Other steps taken to popularise the Japanese Method were as follows :

(i) Inauguration of the campaign by the Lt.-Governor.

(ii) Distribution of printed leaflets in English and Hindi on the Japanese method.

(iii) Setting up of State, district, tehsil and village committees of progressive farmers and officials for organizing campaigns on paddy cultivation.

(iv) Sowing of properly manured and raised nursery beds at suitable places for demonstration.

(v) Use of low seed-rate demonstrated against local practice of high seed-rate.

(vi) Demonstrations in application of fertilisers at various stages and other cultural practices as recommended under local conditions.

(vii) Supply of fertilisers on deferred payments.

The above methods were followed by 308 cultivators in an area of 190 acres in 1953.

In the year 1954, the campaign was intestified and the system of sowing buffer nurseries for free supply of seedlings for demonstration purposes introduced. A large number of demonstration plots were sown in cultivators' holdings and at Government farms. Definite areas were assigned to each extension worker for concentration. The achievements for 1954 are :

(1) Total area brought under the campaign	1,620½ acres
(2) Number of cultivators adopting this method.	2,037
(3) Number of demonstration plots laid :	1,259
(i) On cultivators fields.	1,180
(ii) On Government farms.	79
(4) Total quantity of fertilisers distributed :	2,077
(i) Ammonium sulphate.	850 maunds

(ii) Superphosphate. 678 maunds

(iii) Other fertilisers. 548 „

(5) Improved paddy seed distributed 191 „

(6) Average additional yield obtained over local method. 10 maunds 16 seers per acre.

HYDERABAD

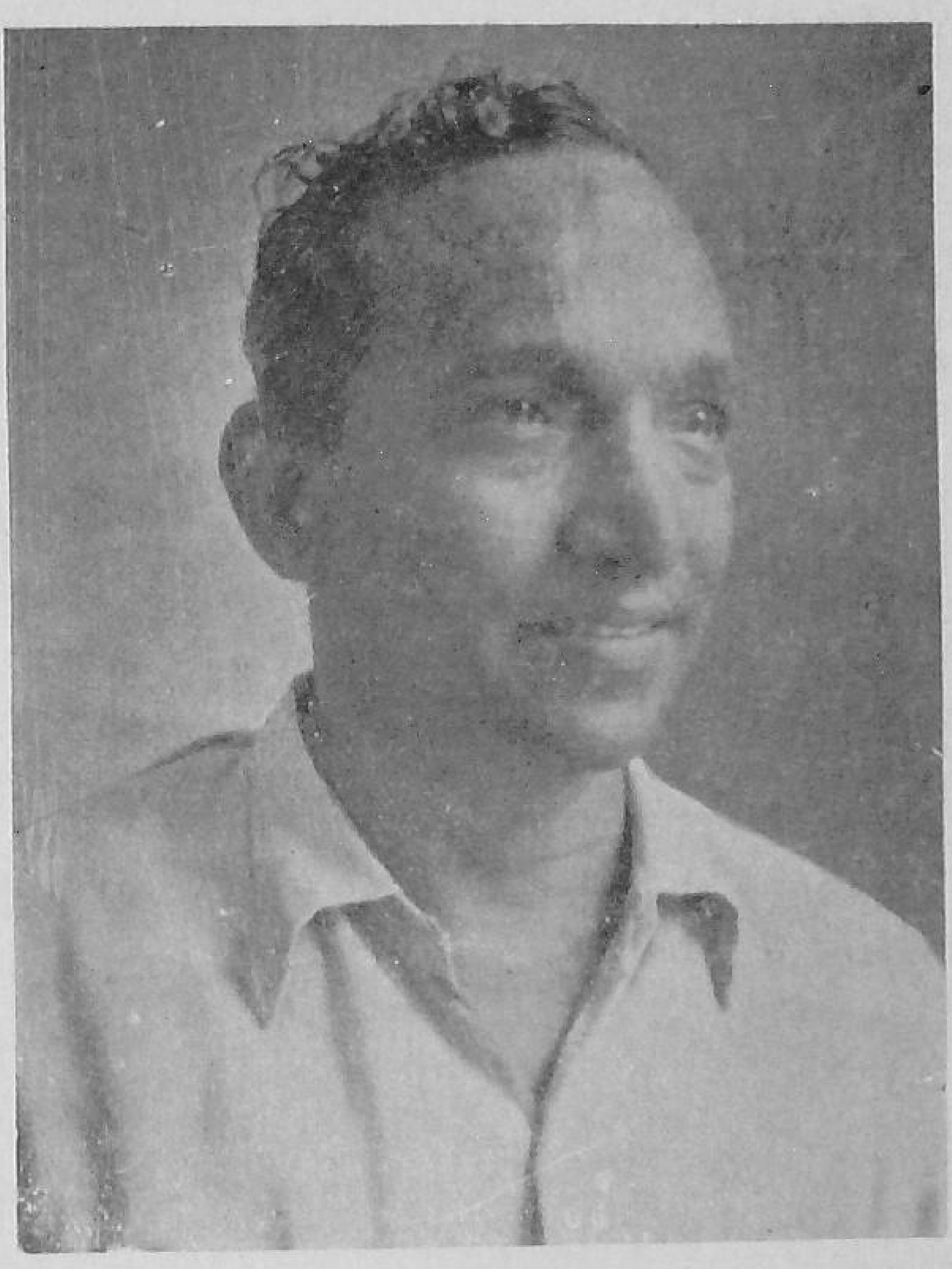
1953-54 : In response to the directives from the Government of India, the Government of Hyderabad nominated the then Deputy Director of Agriculture (Headquarters) and the present Joint Director of Agriculture, as officer-in-charge of the campaign for the promotion of the Japanese Method of Paddy Cultivation in the State.

As the Tabi of 1952-53 was in progress then, experiments to test the efficiency of the key-points of the Japanese Method of Paddy Cultivation were immediately laid out on the Main Experiment Farm, Himayetsagar. A meeting of the Deputy Directors of Agriculture and Assistant Director of Agriculture of the rice belt, and the Rice Specialist, the Agricultural Chemist, the Government Entomologist and the Plant Pathologist was convened at the Agricultural Directorate on March 9 and 10, 1953. The officer-in-charge of the campaign explained the details of the Japanese Method of Paddy Cultivation, and supplied first-hand information on the method, as he had visited Japan in 1952, and explained the steps to be taken to implement it. The officers assembled were shown the experiments in progress at Himayetsagar. After a thorough discussion of the several aspects of Japanese Method of Paddy Cultivation, the following decisions were taken :—

(i) The campaign should be implemented in the districts of Nizamabad, Warangal, Nalgonda, Karimnagar, Adilabad, Hyderabad, Mahbubnagar and Medak ;

(ii) The campaign work should be assigned to the men already working in those districts ;

(iii) The raised seed-bed recommended was unsuitable to local conditions :



Shri Harish Chandra Patil, one of the Pioneers of the Japanese Method of Paddy Cultivation in India.

(iv) Considering the local practices, the campaign was to be implemented in three stages. The cultivators were divided into three classes, namely, A, B, and C. The 'A' class cultivators were to adopt all the improved methods recommended, such as spacing, application of 640 lbs of paddy fertilizer mixture per acre, etc. The 'B' class cultivators were to adopt the improved practices, but to apply only 320 lbs of paddy fertilizer mixture, while the 'C' class cultivators could adopt their own methods but apply at least 240 lbs of paddy fertilizer mixture per acre. The officer-in-charge of the campaign took up two important paddy growing districts—Nizamabad in the Nizamsagar Project area, and Mahbubnagar, which has a larger number of taluks. He visited nearly 50 important villages in each of the above districts and explained to the cultivators the importance and advantages of the Japanese Method of Paddy Cultivation. Because of his long stay in these districts in different capacities and the confidence the cultivators had in him, the movement got a good impetus and as a result 50 per cent of the total target could be achieved in the above two districts.

(v) The Hyderabad Government was to be approached for the relaxation of taccavi rules so that farmers who were in arrears in the repayment of taccavi loans may be granted fresh taccavi for the purchase of fertilizers. This was in addition to the then existing concession by which fertilisers were supplied as hypothecation against crops, so that the value of fertilizers could be realised in kind at harvest time.

(vi) The publicity material supplied in promotion packets should be used judiciously;

(vii) Adequate number of demonstration plots should be set up

(viii) The prize scheme for the best workers was also announced; and

(ix) Experiments should be undertaken on the Government farms situated in the rice zone for testing the efficiency of the several key-points of the Japanese Method of Paddy cultivation,

The campaign was inaugurated by the Union Minister for Agriculture and the State Minister for Agriculture on March 15, 1953, through broadcast talks from All-India Radio.

The sustained propaganda in favour of the Japanese Method of Paddy Cultivation carried out by All-India Radio and in the Press stimulated the farmers to adopt it, although cautiously. Thousands of leaflets written in local languages describing the method, with suitable modifications, were prepared and distributed throughout the State. Arrangements were made to train the workers, both official and non-official, who were in charge of the campaign.

A large number of demonstration plots were put up in the fields of the cultivators where all the important features of the Japanese Method of Paddy Cultivation were tried simultaneously, so that the cumulative effect and the practicability of the Japanese Method of Paddy Cultivation under village conditions could be visually demonstrated. While these demonstration plots formed the training ground for extension workers and the farmers who were sceptical about the new method, it also created interest in those who were indifferent to it.

The relaxation in the rules governing the grant of taccavi and the concessions by which fertilisers were made available as hypothecation against crops, so that the value of the fertiliser could be repaid in kind, served as powerful incentives. These timely concessions, aided by a favourable season, resulted in an unprecedented offtake of fertilisers.

As the season advanced, the workers at all levels vigorously carried the message of the Japanese Method of Paddy Cultivation to the doors of the cultivators. The best results were secured in Nizamabad district, where the farmers adopted almost all the accepted key-points of the Japanese Method of Paddy Cultivation. It was a great sight to see the farmers transplanting their crops in straight rows—a thing that was never done before.

The scheme for the award of prizes to the best workers-a project jointly financed by the Centre and the State-acted as a big incentive to the extension workers engaged in the campaign.

In the Abi season, 15,815 acres were cultivated under this method in all details. In addition, the method was partially adopted over 1,28,969 acres. In like manner, in the Tabi 5,514 acres under the first category and 53,000 acres under the second category were planted in accordance with the Japanese Method of Paddy Cultivation. Thus 2,03, 298 acres were under Japanese Method of Paddy Cultivation in 1953-54. The number of cultivators who participated in the above achievements was 48,893.

Dr. N. Parthasarathy, Director, Central Rice Research Institute, Cuttack, had visited Japan in 1953 under the auspices of the Food & Agriculture Organisation. He toured the different rice regions of Japan and had studied, first-hand, the research and extension set up in that country. To take advantage of his experience and first-hand knowledge of rice cultivation, he was invited by the Hyderabad Government to tour the rice belt. He visited the State in March, 1954, and inspected the progress of the Japanese Method of Paddy Cultivation in the five important rice-growing districts of the State, namely, Hyderabad, Medak, Nizamabad, Karimnagar and Warangal. He made the following recommendations :—

(i) The importance of low seed rate should be further impressed on the cultivator.

(ii) The cultivator should be educated to remove the seedlings of *Panicum Crusgalli* from the nursery and the field.

(iii) In the Abi, a spacing of 10" x 6" may be recommended and in the Tabi, 6" x 4".

(iv) Growing green manure crop for the Tabi by raising *Sesbania Speciosa* along the bunds in August

(v) Late planting of the Tabi crop to get over the incidence of stemborer, especially in Nizamabad district.

(vi) The manure to be applied may be 60 lbs. Nitrogen and 45 lbs. phosphate. All phosphate should be applied initially and not later. To facilitate this practice, the paddy fertilizer mixture must be made of one part of nitrogen and one part of phosphate so that it may be applied before planting. The second dose should contain only

ammonium sulphate, which shouldbe applied a month after planting in the case of short duration varieties, and one and half months after planting in the case of long duration crop.

Campaign in 1954-55: The Government of India, encouraged by the results of the campaign in the previous year, launched upon a more intensive drive, so that the progress attained might be maintained and a further leeway made to reach the stage of complete self-sufficiency. A target of 20 lakh acres was fixed for the country as a whole. Besides, the facilities made available in the previous year by way of loans to State Governments for the purchase of fertilisers, free publicity material, etc., were continued. To act as liasion between the Centre and the State, regional campaign officers (J. P. C.) were appointed. These regional campaign officers acted as the eyes and ears of the Centre at the State level.

One of the regional officers had his headquarters at Hyderabad. Hyderabad State was allotted a target of 50,000 acres out of the all-India target of 2,000,000 acres. This target was classed as category A. The State agreed to adopt all the key-points of the Japnaese Method of Paddy Cultivation except the raised seed-bed. The manure dose fixed at 520 lbs of paddy fertilizer mixture to provide 60 lbs nitrogen and 45 lbs phospate Besides, the State undertook to cover 1,92,000 acres under B category, *i.e.* using 260 lbs of fertilizer mixture per acre.

The first anniversary of this epoch-making campaign was observed on March 15, 1954, with a broadcast by the Union Minister for Agriculture, from All-India Radio, New Delhi. The State Minister for Agriculture also made a broadcast on the same day. These were followed by farmers' classes in all the rice-growing talukas, at which a course of lectures regarding the Japanese Method of Paddy Cultivation was given to the cultivators by the Extension personnel.

The publicity material supplied by the Centre was distributed in the rice zone. When the campaign was on, some enthusiastic Extension men and cultivators composed folk songs and ballads eulogising the Japanese Method of Paddy Cultivation. These were sung on the Republic Day and at other ceremonial occasions. In this context, special mention may be made of the contribution made by Shri S.S. Batrachari of Shaligouraram village, in Nalgonda District.

At the beginning of the campaign, the State Department of Agriculture had a stock of 1,28,260 maunds of improved paddy seed in their godowns, which was more than sufficient to cover the entire target area. Besides, the ground balances of fertilisers were a little less than 50 per cent of the requirements. Hence, expeditious arrangements were made for the movement of fertilisers into the departmental godowns.

The campaign had a very good beginning. The cultivators came in large numbers to the departmental godowns for receiving the fertilisers. But, unfortunately, when the distribution was at its peak, the State Government changed its policy and withdrew the concessions granted in the offtake of fertilisers.

The special feature of this year's campaign has been the introduction of Japanese Method of Paddy Cultivation in the Tungabhadra Ayacut, where 240 acres were brought under A category of the Japanese Method of Paddy Cultivation and 1,000 acres under B category.

The State Department established 1,597 demonstration plots in a very large number of villages, some of them tucked away deep in the interior, to bring home to the cultivators the benefits of the Japanese Method of Paddy Cultivation. One of the agricultural assistants was deputed to undergo a long-term training course in the Japanese Method of Paddy Cultivation at Karjat. The prize scheme for field workers was continued during this year. It is expected that a major portion of the remaining target will be achieved in the Tabi as the season happens to be a very favourable one.

Experiments to test the efficiency of the several key-points of the Japanese method commenced in the Tabi of 1952-53 and carried through in the next 3 seasons. The general conclusions are :—

(i) the combination of heavy manuring (64 lbs nitrogen plus 32 lbs phosphate and the local method of spacing 6" x 4" has given significant yields.

(ii) With the aforesaid heavy manure all of which was applied in the puddle, two interculturings were given by a rotary weeder a positive response was obtained in Tabi 1953-54. This experience is at variance with that of the previous year.

The experience gained by the conduct of the Japanese Method of Paddy Cultivation campaign in 1953-54 and 1954-55 brought out the following points :—

(i) *Use of Improved Seed*: The farmers were being continuously educated about the advantages of the improved varieties. Their sense of appreciation grew when they used the improved seed along with the other recommendations of the Japanese Method of Paddy Cultivation. They found that higher fertilisation implicit in the Japanese Method of Paddy Cultivation brought out the fertiliser response of the improved varieties in a most convincing way. The varieties which were used on fairly large areas were HR. 35, H.R. 19, HR.12, RDR.4 and MTU.15.

(ii) *Selection of Healthy Seed for sowing*: The cultivators had no objection for following the brine method and perenox pre-treatment recommended in the Japanese Method of Paddy Cultivation. On the other hand, they expressed a preference for them.

(iii) *Low-Seed Rate*: The farmers were convinced that a seed-rate of about 15 to 20 lbs per acre fully met their requirements. In some cases, it was reported that even this seed-rate was found to be excessive.

(iv) *Raised Seed-beds*: The raised seed-bed with its concomitant hand watering was found expensive and, therefore, had to be done away with. The ordinary method of raising nursery with slight modifications by way of providing drains and making the bed long and narrow served the purpose.

(v) *Central Nursery*: The Centre recommended that seed-lings be raised at a central place and distributed to the outlying areas. The idea was very carefully examined in the light of past experience. It was finally deferred, although a small beginning was made.

(vi) *Adequate Manuring of Seed-beds*; Generally, the cultivators are in the habit of applying a fairly heavy dose of paddy fertilizer mixture Whrever the growthappears to be stunted, a

small dose of ammonium sulphate is given to boost up the nursery. This practice appears to be a satisfactory one.

(vii) *Row Planting*: To begin with, there were some doubts regarding the expenditure involved in the row planting advocated under the Japanese Method of Cultivation. As the planting progressed and the labourers got used to it, it was found that as against 15 to 20 labourers required for transplanting an acre under the local method 10 to 15 sufficed for row-planting. As the row-planting was adopted more and more, the question of correct inter-row and inter-hill distances assumed growing importance, and the farmers had to be told, in subsequent seasons, that there was no fixity in the matter. It was, however, found that 10" x 6" and 6" x 4" would be the optimum distances for the Abi and Tabi seasons, respectively.

To enable row-planting to be done with facility and ease, chains made of steel wire were designed by a farmer of Nizamabad district and by a local implements manufacturer. A great number of these chains have been and still are being used.

(viii) *Manures and Manuring*: A reference has already been made to the fact that in 1953-54, three levels of fertilisers were recommended, namely, 640 lbs, 320 lbs and 240 lbs. Some of the cultivators felt that by employing the first level, the crop might lodge and blast might appear. So a slight modification was made by replacing a part of the inorganic fertilisers by organic manures. As a result, the undesirable effects referred to above, were not noticed. Wherever the farmers used 240 lbs of fertiliser mixture, the crop did not show adequate response. It, therefore, indicates that in order to get an optimum economic return, a dose of 60 lbs N and 30 lbs P 205 would be required.

In 1954-55, only two levels of manures were adopted *i.e.* 520 lbs and 260 lbs of fertiliser mixture. The condition of the fertiliser mixture was also changed so that the first level would provide 60 lbs N and 45 lbs P205 and the second one would supply half the quantities.

(ix) *Inter-Culture*: Frequent interculturing is a special feature of the Japanese Method of Paddy Cultivation and is related to intensive manuring. Hence, the promoters of the Japanese Method of Paddy Cultivation introduced "Touchi Gurma", commonly known as "Rotary Weeder" for effectively interculturing the crop. The rotary weeder reduces the weeding bill to nearly a quarter, turns in the weeds into green manure, serates the soil, prunes the roots, and places the fertilisers deep. The plants get earthed up, which will result in a better intake of plant nutrients. In short, the working of the weeder cuts down the cost and boosts up the yield.

In heavy soils, the rotary weeder could not be worked as a push-hoe. Hence, the local fabricators were advised to provide a hook to the float, so that a string may be tied for pulling. In this way it was found that two boys, one pull and the other to keep it in position, could easily work it. It was observed that two boys would be able to cover about three-fourths of an acre in a day.

A Secunderabad firm got interested in the manufacture of the rotary weeder. Blueprints were obtained from the Indian Council of Agricultural Research and with their help they commenced fabricating it in sizes suitable for a 10″×10″ and 6″×4″ spacing. They sold about 12,00 weeders in the first season. A large number of artisans of Nizamabad district started copying these weeders. It was reported that they made about 30 weeders and sold them to the cultivators. In 1954-55, little over 1,000 weeders were manufactured and sold to the cultivators.

(x) *Experiments*: Field experiments for testing the efficiency of the several key-points of the Japanese Method of Paddy Cultivation will be continued on the several experiment stations situated in the rice belt.

(xi) *Award of Prizes*: The scheme for the award of prizes to the best workers, financed by the Centre and the State Government, was in operation in 1953-54 and 1954-55. This created a very keen competitive spirit among the field-workers,

which contributed not a little to the rising tempo of the campaign. It is necessary that this scheme be continued for a reasonably long period.

(xii) *Yields*: The farmers of Hyderabad State are fully impressed with the Japanese Method of Paddy Cultivation. Though the Japanese Method of Cultivation gave as high an yield as 10,872 lbs per acre, the average yield obtained is variously estimated as from 3,500 to 4,000 lbs per acre in the case of long-duration varieties and 2,500 to 3,000 lbs in the case of short-duration varieties, as against 2,000 and 1,800 lbs per acre, respectively, obtained by the local method.

(xiii) *Plans for Future*: In the present context of falling prices, the farmers, who till yesterday were very enthusiastic about the use of the fertilisers, which is an essential part of the Japanese Method of Paddy Cultivation, have now begun to falter. Hence, ways and means have to be devised for cutting down the cost without prejudice to the efficiency of farming techniques. The farmers have to save on the cost of seed, weeding and interculture and manures with slight modifications in the schedule that is now being adopted. The low seed-rate and row-planting with the concomitant use of the rotary weeder are, no doubt, two of the important key-points of the Japanese Method of Paddy Cultivation. The third important recommendation may, under the prevailing circumstances, be modified to include extensive use of green manuring, as a partial replacement of inorganic fertilisers. These measures taken conjointly will provide the farmer the money needed for buying fertilisers.

HYDERABAD

Targets and Achievements during *Abi* 1953-54 under Japanese Method of Paddy Cultivation

S. No.	Name of the District	A Class		B Class		C Class		Total	
		Target (acres)	Achievement (Acres)	Target (acres)	Achievement (acres)	Target (acres)	Achievement (acres)	Target (acres)	Achievement (acres)
1	2	3	4	5	6	7	8	9	10
1	Nizamabad ...	2,500	9,146	10,000	20,076	50,000	23,698	62,500	52,920
2	Warangal ...	1,200	1,181	4,800	4,656	24,000	21,309	30,000	27,146
3	Nalgonda ...	800	508	3,200	1,412	16,000	4,515	20,000	6,435
4	Karimnagar ...	900	1,361	3,600	3,873	18,000	11,249	22,500	16,483
5	Adilabad ...	400	89	1,600	492	8,000	1,180	10,000	1,761
6	Hyderabad ...	400	232	1,600	164	8,000	367	10,000	673
7	Pilot Dev: Project ...	600	465	2,400	367	12,000	489	15,000	1,321
8	Mahboobnagar ...	1,500	1,546	6,000	4,804	30,000	7,041	37,500	13,391
9	Medak ...	1,700	1,184	6,800	3,735	34,000	17,650	42,500	22,569
10	Nanded ...	...	25	...	50	...	40	...	115
11	Gulberga ...	...	34	...	136	...	680	...	850
12	Raichur ...	...	44	...	184	...	802	...	1,030
	Total ...	**10,000**	**15,815**	**40,000**	**39,949**	**2,00,000**	**89,020**	**2,50,000**	**1.44,694**

HYDERABAD

Targets and Achievements during *Tabi* 1953-54 under Japanese Method of Paddy Cultivation

S. No.	Name of the District	A Class Target (acres)	A Class Achievement (acres)	B Class Target (acres)	B Class Achievement (acres)	C Class Target (acres)	C Class Achievement (acres)	Total Target (acres)	Total Achievement (acres)
1	2	3	4	5	6	7	8	9	10
1.	Nizamabad ...	4,200	2,059	7,320	2,779	20,000	12,288	31,520	17,126
2.	Warangal ...	800	496½	2,960	941	10,000	3,044	13,760	4,481½
3.	Karimnagar ...	2,400	834	7,040	2,973	18,000	4,944	27,440	8,751
4.	Mahboobnagar ...	2,400	993	2,440	3,509	20,000	7,985	24,840	12,437
5.	Dindi (Nalgonda) ...	800	421	4,580	288	8,000	1,236½	13,380	1,945½
6.	Khanapur (Adilabad) ...	800	20½	4,500	40	8,000	380	13,300	440½
7.	Medak ...	800	400	2,780	1,600	25,000	8,000	28,580	10,000
8.	Pilot Dev : Project ..	100	...	3,220	...	1,000		4,320	...
9.	Hyderabad ...	...	191	...	406	...	1,391	...	1.988
10.	Khammam ...	...	67	...	139	...	529	...	735
11.	Nanded ...	...	...	...		..	100	...	100
12.	Gulberga ...	...	32	...	80½	...	348	...	460½
13.	Raichur ...	...	...	...	...	...	...	...	...
	Total ...	**12,300**	**5,514**	**34,840**	**12,755½**	**1,10,000**	**40,245½**	**1,57,140**	**58,465**

HYDERABAD

Target and Achievements during Abi 1954-55 during Japanese Method of Paddy Cultivation

S. No.	Name of the District	A Class Target (acres)	A Class Achievement (acres)	B Class Target (acres)	B Class Achievement (acres)	Total Target (acres)	Total Achievement (acres)
1	2	3	4	5	6	7	8
1.	Nizamabad ...	25,000	18,220	50,000	32,824	75,000	51,045
2.	Warangal ...	5,000	1,652	25,000	9,071	30,000	10,723
3.	Nalgonda ...	2,000	2,200	15,000	12,545	17,000	14,745
4.	Karimnagar ...	5,000	1,385	20,000	5,861	25,000	7,246
5:	Adilabad ...	500	667	5,000	2,647	5,500	3,314
6.	Hyderabad ...	2,000	651	10,000	1,615	12,000	2,266
7.	Mahboobnagar ...	5,000	828	25,000	2,570	30,000	3,398
8.	Medak ...	5,000	4,710	30,000	19,709	35,000	24,414
9.	Nanded ...	150	150	500	290	650	440
10.	Gulberga ...	200	171	500	184	700	355
11.	Raichur ...	150	480	500	1,072	650	1,552
12.	Khammam ...	1,000	730	5,000	7,666	6,000	8,396
	Total ...	**51,000**	**31,844**	**1,86,500**	**96,054**	**23,7,500**	**1,27,894**

N.B.—Statement for year 1954-55 has not been recieved so far.

HYDERABAD

Names of Districts in which the prizes for promotion of Japanese method of paddy cultivation have been awarded during 1953-54.

		1st prize, Rs. 250	2nd prize, Rs. 150
1.	Sangareddy	...	...
2.	Hyderabad	Shri Rashid Mustafa	Shri Nazarates
3.	Warangal	Shri N. Chandrayya Naidu (agricultural asst.)	Shri Mahboob Husain (fieldman)
4.	Adilabad	Shri J.P. Nageshwar Rao (agri. asst.)	Ch. Rammurthy (fieldman)
5.	Nalgonda	...	...
6.	Mahboob-nagar	Shri B. Kondiah, (agri. asst.)	Shri J. N. Ratnam (fieldman)
7.	Karimnagar	Shri R. Narayan Rao (Agr. Asst.)	Shri M. Nancharaya (agri. asst.)
8.	Nizamabad	Shri Sambha Shiva Rao, (fieldman)	Shri Faqruiddin (Kamgar)

KUTCH

In Kutch the area under paddy-cultivation is hardly 30 acres. This is because climatic conditions of Kutch, are not favourable for large scale paddy cultivation. The average rainfall is 15″ and the soil is mostly sandy. However, to introduce the Japanese Method in the area under paddy cultivation the following steps have been taken :—

(1) A pamphlet on the Japanese Method of paddy cultivation in Gujarati language has been published and is distributed free to the cultivators.

(2) A film on the Japanese Method issued by the Indian Council of Agricultural Research is being shown to cultivators on various occasions, such as fairs and festivals. The members of the staff of Community Project and National Extension Service Blocks are also making use of this film in their respective areas.

(3) Publicity to the Japanese Method of paddy cultivation is given by various posters, charts, flip-books and flannel-graphs supplied by the Indian Council of Agricultural Research.

(4) Improved paddy seeds (Basmati) are being distributed to cultivators. Twenty Six maunds of these seeds were distributed this year.

(5) Demonstration of the Japanese Method is given to farmers on the Agriculture School farm at Vandhay where efforts are made to raise seedlings of paddy for supply to cultivators on demand.

MADHYA BHARAT

In Madhya Bharat, paddy crop is grown over an area of 2 lakh acres, which is about two per cent of the total cultivated area, and the annual production of rice is about 40,000 tons. Though the crop is grown in almost all districts of the State, the rice areas are mostly concentrated in Jhabua, Gird, Nimar, Dhar, Shivpuri, Indore and Bhind districts.

Out of the total area under rice, only about 50,000 acres or 25 per cent is irrigated, while the rest is grown under "barani" conditions without any irrigation or manure. Irrigation by canals is done in an area of 40,000

acres, the rest being irrigated by tanks and wells. The area under paddy cultivation in the State, is thus small, as compared with other States and countries. Moreover, there has been a decline in the area under paddy from 3.12 lakh acres in 1949-50 to 2.00 lakh acres in 1953-54. But this was mainly due to the vagaries of the monsoon, and the transfer of area to cash crops, chiefly cotton. The matter has been seriously engaging the attention of the State Government.

The average yield of rice in the State during the years 1951-52, 1952-53 and 1953-54 was 130,412 and 538 lbs per acre respectively. This is very low, when compared with the all-India average of 700 lbs and 1,145 lbs in Madras; 1,109 lbs in West Bengal; and 1,062 lbs in Andhra.

Immediately after the country-wide campaign of paddy cultivation by the Japanese method was started, the State set up a committee, with the Development Minister as Chairman, to draw up a programme to popularise and propagate it. Actual work on the scheme was started on March 15, 1953, when a public meeting was arranged at Pipandi Head, in Gohad Pargana. The Chief Minister and the Development Minister also issued appeals to cultivators to take to the new method.

The officers of the Revenue and the Agriculture Departments in the districts, as well as public workers, addressed cultivators at weekly fairs, melas and exhibitions, and explained to them the various advantages of the new method of paddy cultivation. In each of the rice-growing areas, an agricultural demonstrator was put in charge of a group of villages to demonstrate the new method to every paddy grower at every stage of the crop.

For this purpose, 70 centres were established and 849 demonstration plots organised. A booklet in Hindi, explaining the method and recommendations of the Department was published and 30,000 copies were distributed to villagers. Charts were exhibited at prominent places in villages, and the departmental cine-van was used extensively for propaganda and for exhibiting the film on "Rice Cultivation by Japanese Method."

Mass transplanting of paddy was arranged in Purani Chhaoni, in Gird district, while students of the Agriculture College and Agriculture School, Gwalior, demonstrated the techniques of the new method to villagers in the Gohad

area. District committees were also formed to commend the new method to cultivators and to remove their apprehensions and difficulties, if any.

For the benefit of the cultivators and to propagate the the use of better seed and fertilisers, 197 temporary depots were opened in the interior areas for distribution of superior varieties of seed and chemical fertilisers. It was thus possible to distribute over 265 tons of ammonium sulphate, 153 tons of superphosphate, 207 tons of fertiliser mixture, and 3,920 maunds of improved varieties of seed to paddy-growers during the year 1953.

Apart from this, crop competitions were organised in different paddy-growing areas of the State and prizes of Rs. 500, 300 and 150 were awarded to first second and third winners respectively in each of the four zones. Eighteen consolation prizes of Rs. 75 each were awarded to those cultivators who could not secure higher yields, but who nevertheless had taken keen interest in propagating the new method.

The 1954 paddy campaign was started in the State on March 26, 1954, when a large gathering of cultivators in Sigora village in Gird district, was addressed by the Development Minister of the State. Some of the winners of the paddy crop competition during 1953 narrated their experiences and demonstrated how the new method was both economical and beneficial.

During the year, 171 centres were started to bring home to cultivators the techniques and benefits of the Japanese Method of Paddy Cultivation. In all, 4,268 meetings were held. Demonstrations were conducted in 1838 plots. Other methods of publicity and propaganda adopted during the previous year were further accelerated. Campaigns were organised in each district. The temporary depots distributed 558 tons of chemical fertilisers and 3,447 maunds of better varieties of seed.

For paddy crop competition, the State was divided into six zones and prizes of Rs. 500, Rs. 300, Rs. 150, Rs. 75 and Rs. 75 were declared for the first, second, third, fourth and fifth winners in each zone. Besides this, three consolation prizes of Rs. 100 each and one State Prize of Rs. 1,000 were also sanctioned. The response from cultivators was encouraging, as 1,208 competitors, as against 507 of the previous year, took part in the competition. The highest yield of 162 maunds per acre was obtained by Shri Jagan

Nath Bhairaji of village Biaoli in Dewas district. In all, 28 cultivators obtained yields of over 100 maunds per acre.

During 1954, 22,623 acres of paddy were under the Japanese Method of Paddy Cultivation, as against 15,262 acres during the previous years.

MADHYA PRADESH

There are about 90 lakh acres under paddy in Madhya Pradesh, of which 79 lakh acres are under broadcast and 11 lakh acres under transplantation. The irrigated area under broadcast is about 10 lakh acres and under transplantation 6 lakh acres. In addition, there are about 5 lakh acres under "dry transplanted" paddy.

1953-54 : The Japanese Method of Paddy Cultivation was introduced in the State in 1953–54. Efforts were made to popularise this method, particularly in the districts of Bhandaras, Balaghat, Chanda and parts of Nagpur and Jabalpur districts, where the transplantation method of paddy cultivation was already in vogue and where adequate irrigation facilities were available.

A target of 10,000 acres of area to be brought under the Japanese method during the year was distributed in five districts, but subsequently this arrangement was revised and refixed at 5,000 acres.

The line of work adopted for the introduction and popularisation of the Japanese Method of Paddy Cultivation in the State included the distribution of literature, training of the Agricultural Extension staff, training of cultivators, layout of ocular demonstration plots on cultivators' fields, layout of experimental plots on Government farms and layout of the Indian Council of Agricultural Research experiments on cultivators' fields.

Forty-five thousand copies of departmental leaflets on the Japanese Method of Paddy Cultivation (20,000 Hindi, 20,000 Marathi and 5,000 English) were printed at the local Government Press and distributed to the cultivators; 3,000 Hindi and 8,000 Marathi posters were distributed to cultivators and pasted at important places in the villages.

Ten "Tauchi Gurumas" and 200 Karjat hoes were obtained; the former were sent to Government farms and the latter distributed to cultivators.

Twenty film strips received from the Indian Council of Agricultural Research were distributed to the paddy districts for exhibition widely.

Training classes for extension and propaganda staff of the department were organised at the Government Farm at Sindewahi, and 168 workers were trained.

Eight farm superintendents of important paddy farms were deputed for one week's training at Karjat in Bombay State.

Eight experiments for testing the merits of the Japanese Method of Paddy Cultivation were laid on the cultivators' fields. These experiments were financed by the Indian Council of Agricultural Research.

Apart from the above, experiments for working out the economics of the Japanese method, its labour requirements, etc., were also laid out on Government farms.

The Japanese method was adopted on 1,500 acres spread over about 500 villages. The result of crop-cutting done in the Japanese method demonstration plots showed that the average extra yield from the new method was about 38 maunds per acre. The maximum yield reported from an acre was 117 maunds 20 seers, the second and third highest being 95 and 90 maunds respectively. This being the first year, emphasis was laid on ocular demonstrations on cultivators' fields and about 500 such demonstrations were arranged.

1954-55: A fairly firm foundation was laid in 1953-54 for expansion of the area under the Japanese Method of Paddy Cultivation in the State. It was observed that the raised seed-bed was more advantageous as it helped in easy and safe uprooting of the seedlings, and this key-point was not much stressed during the previous years' campaign. All the key-points of the Japanese Method of Paddy Cultivation were, however, implemented during the year.

In the light of past experience, the State Department of Agriculture had programmed to bring about 12,000 acres under the Japanese Method of Paddy Cultivation during 1954-55. Later, the target was revised to 2,00,000 acres.

The campaign was inaugurated on March 15, 1954, by the State Minister for Agriculture with a broadcast talk from All India Radio, Nagpur. This was followed by a special Radio interview programme between the Deputy Director of Agriculture, Rice Zone (2) and Shri Narayanlal Gopalrao Ujaoney, Kirshi Ratna, who had obtained an yield of 117 maunds 20 seers of paddy per acre during 1953-54.

In addition to the usual Extension staff of the districts, two extra assistant directors of agriculture were especially deputed for the campaign work and two districts were kept in charge of each for intensive propaganda work.

Special training classes were held for patwaris, revenue inspectors, gramsewaks, teachers and homeguards and other social workers, whose help for propaganda work was obtained.

The Gandhi Smarak Nidhi, Gondia, on their own, opened nine centres for popularising the Japanese method in the five important rice districts of Bhandara, Balaghat, Chanda, Raipur and Durg. Each centre covered 15 to 20 villages. Thus, the work of this organisation was spread to about 180 villages.

The Department prepared locally 75,000 copies (50,000 Hindi and 25,000 Marathi) of a leaflet on the Japanese Method of Paddy Cultivation and distributed them to cultivators.

The State Department of Agriculture prepared a film on the Japanese Method of Paddy Cultivation and nine copies of the film were distributed to important districts for wide exhibition by means of social welfare departmental vans.

Some 20,000 posters received from the Indian Council of Agricultural Research were widely distributed and exhibited. The Department of Agriculture prepared 2,000 Tauchi Gurumas at the Government Central Workshop at Nagpur and distributed them to the different paddy districts for issue on cash and taccavi. The cost of each implement was kept at Rs. 20. Fourteen weeders, received from the Union Ministry of Food and Agriculture, were sent to important paddy farms for trial.

Government farms and plots and the station gardens were asked to grow paddy in their holdings by the Japanese

method. The farm superintendents were instructed to study critically the labour requirements and other aspects of the Japanese Method of Paddy Cultivation again this year to confirm last year's observations.

The Japanese method was adopted on 13,192 acres spread over about 5,000 villages. The highest yield per acre reported was 102 maunds of paddy. Some 13,192 acres have been put under the Japanese method against the target of two lakh acres. Though this is considerably low compared to the target fixed, it compares very well with the achievement of 1953-54, namely, 1,500 acres. Unfavourable weather conditions were mostly responsible for this low progress.

MADRAS

The campaign for propagating the Japanese Method of Rice Cultivation was started in the year 1953. It was found that the circulated method of the Government of India contained practices not suitable to Madras, and the method was, therefore, modified to suit conditions in the State, based on the research and experience of over 40 years. Under Madras conditions, high doses of manure, as in Japan, such as 70 to 100 lb nitrogen, 40 to 75 lb phosphorus and 45 to 75lb potash per acre, are not suitable. The dose was reduced to 20 to 30 lb nitrogen and 25 to 30 lb phosphorus per acre for the field, according to experimental results in Madras, while potash had no value. As high doses of ammonium sulphate were found to increase the incidence of blast and diseases, the dose was reduced to 100 lb of ammonium sulphate in blast-prevalent areas and 150 lb in others.

Manuring of nurseries with artificials gave no increased yields in Madras; also one of the major difficulties of the paddy-grower was the adjustment of the growth of the seedlings to the uncertain time of availability of irrigation water and this was difficult to surmount, if the nursery was very heavily manured. Hence, such manuring was recommended only for the planted fields.

The most important manure and the cheapest was found to be organic manure in the form of green leaf, unlike in Japan, as it directly increased the yield and also benefited the soil. This manure was recommended as a line crop of Sesbania transplanted on the borders of fields for use in the second crop to give 2,000 to 6,000 lbs green leaf per acre, costing only one anna worth of seed per

acre, and as a pure crop giving 50,000 to 70,000 lb of green leaf, sufficient to manure ten times the area in single crop lands, at a cost of only Rs. 2 per acre for seed, as against Rs. 20 for the same result from artificials.

Ammonium sulphate and super-phosphate were also recommended to supplement green leaf to give more yields. In addition to the above modifications, efforts were also made to reduce to seed-rate to the minimum. In Madras a spacing of 4"×4" for short crops and 6"×2" for long duration crops gave higher yields than wider plantings, although 10" spacing is recommended in the original Japanese method. The seed-rate was reduced to a level 16 to 25 lbs for long duration paddy and 30 to 40 lb for short duration varieties, in accordance with the past findings of agronomic experiments in the research stations.

As in Japan, transplantation gave higher yields than broadcasting, and in this State transplanting is the rule except in areas where such practice cannot be adopted due to local factors. Although results of line planting and inter-culture were not conclusive in experiments, ryots were allowed to plant in lines according to their choice. In order to prevent seed-borne diseases, a dry dressing of "Agrosan" or "Carason" was recommended, as "Perenox" recommended in the all-India method was not effective. The above modifications were accepted by the Government of India and leaflets in Tamil on the Madras Japanese Method of Rice Cultivation were printed and distributed to ryots as follows for the years 1953-54 and 1954-55 :

Number of leaflets printed

1953-54	1954-55
20,000	30,000
5,000	6,000
5,000	6,000
30,000	42,000

Besides, the Government of India supplied 9,000 posters in the first year and 20,000 in the second year, and 300 flanelgraphs and 2,000 flip-books. The film supplied by the Government of India was not exhibited as it did not strictly apply to Madras conditions.

The campaign for this method started with a radio talk by the Minister for Agriculture in the middle of

March both in the years 1953 and 1954. Extension workers were given instructions in all the details of the method, and directed to start the campaign from the second week of April onwards throughout the year. Special meetings were convened in the villages in all districts. In these meetings, nurseries were prepared and the seed-rate, raising of 'Sesbania' and treatment with "Agrosan" demonstrated, while ryots were educated regarding the details of after-cultivation. Sesbania packets were sold to ryots in small quantities to meet their demand and about 2 lakhs of such packets distributed in the two years, so that every ryot was given the facilities to grow his own green manure.

In order to educate the ryots, the improved method was explained in meetings of the village agricultural associations, of which 16,000 were formed out of 20,000 villages in the State. Personal contacts were established with ryots adopting the method while growing the crop, and the crops watched on the field. Targets were fixed for the State and allocated to each district, and the progress of the work was watched in fortnightly reports of the district agricultural officers, who were instructed to give details regarding the number of meetings held, the number of demonstration plots laid, Sesbania packets distributed and the area planted.

The achievements under the modified method were as follows :

	1953-54	*1954-55*
Number of demonstrations laid	12,500	10,534
Area of planted paddy (acres)	13,783	415,633

As the ryots became alive to the departmental activities, more members joined in the year 1954 and an area of 415,633 acres was brought under the improved method, against a target of 100,000 acres. The target for 1955-56 has been fixed at one million acres, and there may not be any difficulty in achieving this, as the improved method contains all the essential features advocated for paddy by the Agricultural Department, based on 40 years of research.

A very important aspect of increased production is the supply of improved seed. This has not been sufficiently emphasized in the all-India programme. In Madras, special attention has been devoted to this work. There are now

over 100 improved strains of paddy in Madras suited to different districts and different conditions and seasons.

The most important aspect of seed distribution is purity and spread over a large area. Formerly, improved seed was distributed from secondary seed farms and procured after paying premium, but it was not possible to cover a large number of villages. A new system was, therefore, introduced by which every village could have its own seed farm and improved seed. Primary seed is distributed at the rate of one pound per acre of the village of selected influential ryots through village associations, and the seed multiplied in village seed farms.

As one pound of seed will give 6 lbs, the entire village is covered by improved seeds next year. This system of village seed farms has now been worked in 6,400 villages for paddy and 2,000 tons of paddy have already been exchanged, and it is programmed to cover all important villages by next year. By this method, improved seed is spread to every important village through village seed farms, and distribution is made without any necessity for procurement of secondary seed. This method of village seed farms is a great advance in seed distribution, and has helped supply seeds for every village.

No practical difficulties were experienced in this method as the technical practices were modified to suit Madras conditions. During 1954-55, the supply of ammonium sulphate was delayed, but the targets were exceeded easily as the method was popular everywhere. In Madras, Sesbania was grown over 8 lakhs of acres in 1953-54 and 13 lakh acres in 1954-55 while the quantity of ammonium sulphate consumed was roughly applied to over a million acres. Hence it is easy to reach the target of one million acres in 1955-56.

The present propaganda methods through village associations, special meetings and distribution of small packets of Sesbania helped considerably to promote the extension of the method.

MYSORE

To step up food production in the State, the Japanese Method of Paddy Cultivation was one of the various schemes introduced in the early part of 1953. As an experimental meas ure, the area was limited to about 5,000 acres in places

of assured supply of water, since this was the beginning. The results achieved after the harvest were very encouraging, as the additional yield obtained over the local method was nearly 45 per cent.

Due to these encouraging results, the scheme was to be continued in the year 1954-55 and the Government of India fixed a target of 20,000 acres for this State. As against this target of 20,000 acres, it was proposed to bring about one lakh acres in the channel areas under this method of cultivation.

Intensive propaganda by the executives of the Department was launched up to induce the ryots to cultivate paddy crop under this method. Over 40,000 demonstrations in raising nurseries, application of fertilisers transplanting, interculturing, etc., were laid out on farmers' holdings. Nearly 3,000 meetings were held to teach the agriculturists the Japanese Method of Paddy Cultivation. About 4,545 maunds of good seed paddy costing Rs. 59,600 were sold to the ryots. To encourage the ryot to take up this new method, they were also granted loans for purchasing fertilisers to the extent of Rs 200.

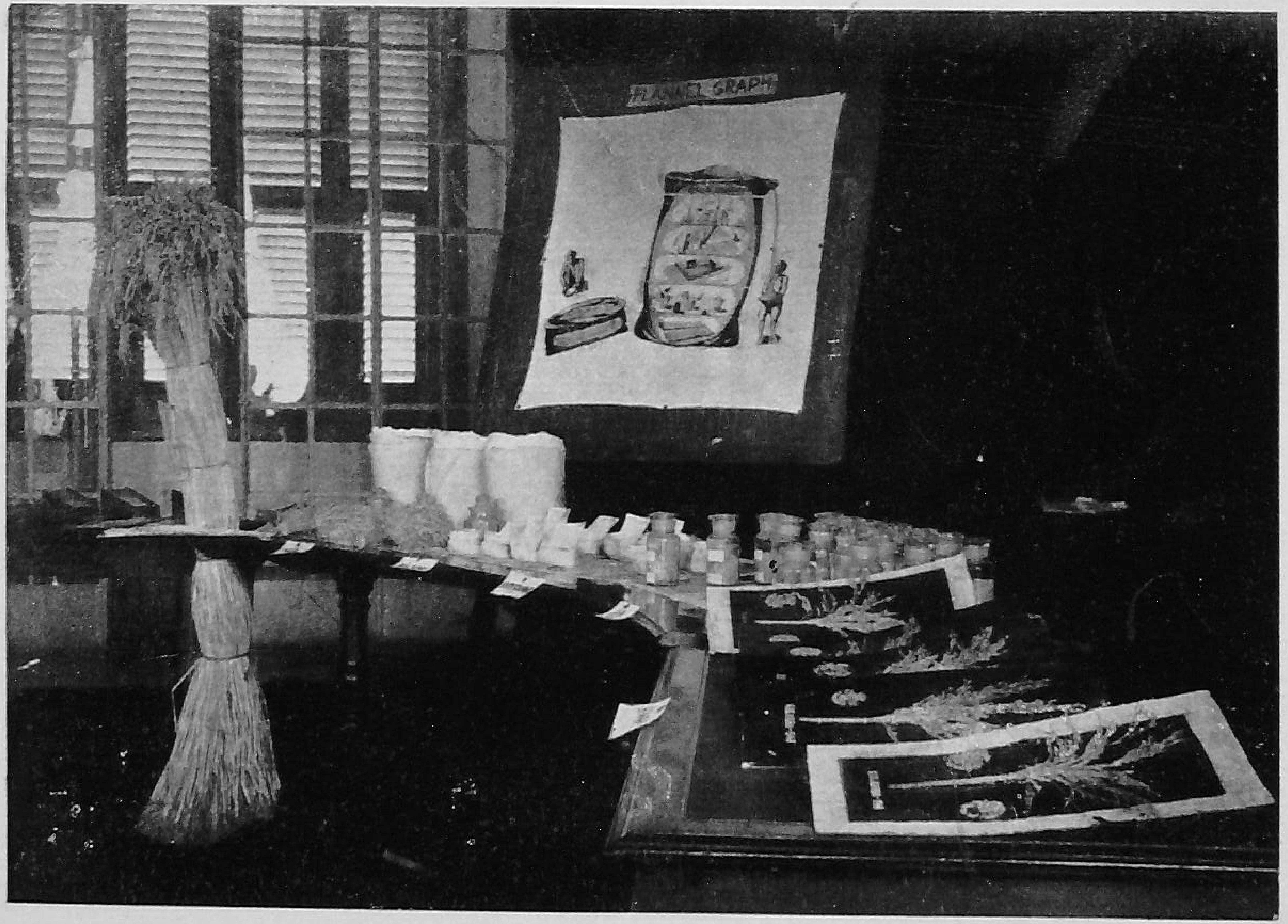
On account of these efforts, it was possible to bring about 90 thousand acres under this method, which practically forms 14 per cent of the total irrigable area in the State. From the crop-cutting experiments conducted during this year, it has been observed that the new technique has resulted in an increased yield of 1,300 lbs of paddy per acre, which is 50 per cent. over the local average yield.

During the year 1955-56, it is proposed to bring one lakh of acres under the new method by adopting all the principles underlying the Japanese Method of Paddy Cultivation. The total cost of the scheme is estimated to be Rs. 76,000. Provision for adequate staff to carry out propaganda and demonstrations during the year 1955-56 on an intensive scale has been made in this budget.

It is expected that an additional yield of 45,000 tons of paddy valued at Rs. 8 lakhs will be realised from this new method.

ORISSA

A campaign for the Japanese Method of Paddy Cultivation was inaugurated in Orissa on March 15, 1953, with a broadcast by the Minister for Agriculture from All



Another view of a section of the four-day exhibition organised by the Union Ministry of Food and Agriculture at New Delhi to popularise the Japanese Method of Paddy Cultivation.

India Radio, Cuttack. Detailed information on the technique of the Japanese method was also published in leading newspapers in the local language. During the remaining half of the month of March and in the two months of April and May, meetings were organised in almost all the villages of the intensive cultivation blocks, demonstrating details of the method in about one or two acres of land.

The resources of the State were fully mobilised for the success of the campaign. Technical officers organised meetings and training centres, and laid out demonstration plots in cultivators' fields and Government farms to popularise the method.

While supply of improved seed continued, arrangements were made for supply of 16,000 tons of ammonium sulphate in place of the normal consumption of about 6,000 tons.

During the years 1953-54 and 1954-1955, the campaign was conducted in the State with full vigour while in the latter year the scope of operation of the campaign was extended and brought under the operation of the Community Development Project and the National Extension Blocks.

A quantitative assessment of steps taken to popularise the method in the State and the results achieved are given below :—

Details of the steps	*Quantitative assessment in 1953*	*1954*
Number of propaganda and training meetings held.	1,769	3,353
Number of propaganda workers posted under the scheme.	240	603
Number of demonstration plots laid.	1,162	2,713
Quantity of improved seeds supplied.	4,736 maunds	5,322 maunds
Number of seed stores opened.	140	168
Quantity of fertilisers distributed.	482 tons	1,285 tons

Details of the steps.	*Quantitative assessment during* 1953	1954
Number of fertiliser depots opened.	124	376
Number of (a) posters (b) pamphlets distributed	(a) 3,000 (b) 30,000	(a) 5,000 (b) 55,000
Total area under paddy	96,18,600 acres	96,18,600 acres
(i) Irrigated	21,30,681 ,,	21,30,681 ,,
(ii) Non-irrigated	74,87,919 ,,	74,87,919 ,,
Area cultivated under the Japanese method.	2,528 ,,	6,574 ,,
Yield of Paddy Obtained Per Acre		
(a) Maximum	98 maunds	102 maunds
(b) Minimum	35 ,,	30 ,,
Target area for 1955	50,000 acres	

Taking into account the progress achieved during the first year of the campaign, the target for 1954 was fixed at 50,000 acres. But the normal progress of the campaign was hampered by serious drought which was experienced almost throughout the State.

The Japanese method mainly depends on increased use of fertilisers, and fertilisers are getting popular in the State. The consumption of ammonium sulphate has increased from 4,000 to 10,000 tons between 1952-1955. It is expected that the Japanese method will spread, in course of time, throughout the State.

The intensive cultivation blocks, which were 72 in number, will be closed in March, 1956. There will be 43 Community Project and National Extension Service Blocks in the State by that date, and it is expected that the whole State will be covered by 250 National Extension Service Blocks during the Second Five Year Plan period. As the technical staff spreads all over the State, the acreage under the Japanese method will go on increasing and every attempt will be made to see that the Japanese Method of Cultivation becomes a normal agricultural practice in the State.

PEPSU

To improve cultural practices of rice crop in India, the Pepsu Government initiated the Japanese Method of Paddy Cultivation campaign in the State in 1953-54.

Covering an area of about 37,000 acres, rice, not an important crop in Pepsu, is grown mainly in Kapurthala, parts of Sangrur and Patiala districts. During 1953-54, about 4,000 acres of paddy crops were brought under the campaign. In 1954-55, a similar campaign was organised with a target of 10,000 acres.

Among the incentives to popularise the new method were the supply of ammonium sulphate on credit, posting of special staff to educate farmers about the new techniques, holding of demonstrations, arrangements for additional irrigation facilities, and issue of popular literature in the local language.

In the second campaign, that is, during kharif 1954, the target was exceeded by over 12,000 acres. The number of demonstrations on cultivators' fields and Government farms amounted to 195. Besides, 943 propaganda meetings were held and 14 specially-trained Mukaddams worked out the programme. The percentage increases in yield reported in 1953-54 and 1954-55 are 25 and 40 respectively.

PUNJAB

1953-54 : The cultivation of paddy on the pattern of the Japanese method was introduced in the State for the first time in *kharif* 1953. The target was 50,000 acres. To achieve this the Extension staff of the Department organised meetings in villages at which the method was explained, and demonstrations given on an extensive scale. Manures such as ammonium sulphate and super-phosphate were offered on taccavi loans for the convenience of the planters. Sub-depots for the distribution of these fertilisers, were opened at many places in the rural areas. Leaflets and pamphlets in all the regional languages were distributed amongst the rural intelligentia. The efforts bore fruit as not less than 38,275 acres were cultivated in accordance with the Japanese method.

1954-55 : During *kharif*, 1954, the Extension staff were alerted and were directed that not less than 1,50,000 acres should be put under this method. Propaganda activities

to popularise the method were intensified. Unfortunately, monsoon rains failed at the time when they were needed most. The method thus received a set-back. Moreover, the supply of ammonium sulphate from Sindri failed during the months of July, August and September, 1954. The crop could not, therefore, be manured at most of the places. Thus only 4,4874 acres could be cultivated by this method.

Unfortunately, higher yields of paddy are obtained by adopting and following the Japanese Method. The progressive planters have been getting double the yield, but it has been estimated that on an average, an additional yield of 6 maunds per acre is obtained. The total gain to the cultivators and the State has been very considerable.

RAJASTHAN

1953-54 : The Japanese Method of Paddy Cultivation was introduced in the State in the *kharif* season of 1953-54. Its inauguration was marked by the meetings of farmers held at several places in the paddy-growing districts of Rajashan. These were attended by the Director of Agriculture, commissioners of divisions, collectors and several other officials and non-officials.

During the last paddy season, the departmental staff and the officer on special duty for paddy, contacted a large number of cultivators by organising meetings, in which the improved method of paddy cultivation and its advantages were explained to the farmers. Full use of publicity material, received from the Union Government, was made in this connection.

Four agriculture assistants, who had undergone practical training in the Japanese method, have been posted this year in the important paddy-growing districts.

Farmers who, initially, could not realise the importance of the method, met with pleasant surprise when the crop cultivated by the Japanese method was harvested and weighed.

Among the salient features of the Japanese method, in some districts one feature of the method was more appreciated than the other, depending upon local practices, type of soil and other environmental conditions. But, on the whole, proper spacing, higher doses of fertilisers and after-care did pay rich dividends wherever they were followed. The traditional belief, that more plants at closer spacing give

higher yields, gave way to thinner plantation at regular distance. Raised seed-beds were not appreciated, except in tehsil Baran of Kotah district. Well-prepared, flat, seed-beds, mixed with sufficient quantity of farm yard manure or compost, did help in raising healthy plants.

In view of the experience gained with the working of the Japanese method in 1953-54, the following modifications have been advocated :

(1) Preparation of flat seed-beds, incorporating well-rotten farm yard manure—40 to 50 cart-loads per acre.

(2) Transplantation of seedlings at 9 inches apart both from plant to plant and from row, with or without the use of a string. In case of delayed transplantation due to late rains, the distance between the plants was to be reduced to 6 inches. The leaves may be chopped by 3 to 5 inches, wherever the plants are found to be overgrown.

(3) The quantity of ammonium sulphate be adjusted according to the quantity of farm-yard manure available, the general soil fertility and the time of transplantation. A dose of 1¼ to 2½ maunds of ammonium sulphate per acre has been recommended.

(4) In case the crop growth is found luxuriant, the top leaves be cut by 6 to 12 inches, before influorescence, to safeguard against lodging.

(5) The entire quantity of phosphatic fertilisers (2½ maunds per acre) be applied to the field at the time of puddling.

1954-55 : During the current year, due to late rains all over Rajasthan and due to complete failure of the monsoon from the middle of July to the first week of September, the area under paddy has been considerably reduced. At certain places, transplantation of seedlings could not be carried out till the first week of September. Inadequacy of rains also compelled paddy-growers to take recourse to broadcasting of a coarse variety of paddy.

The total rainfall up to the end of August, was hardly 10 to 15 inches in Dungarpur and Banswara

districts as against an average of 30 inches for that period. The paddy-growing area of Ganganagar recieved 1.30 inches only, against the normal 9 inches.

To do the best under adverse conditions, some of the important features of the Japanese method were applied to the broadcast crop as well. Thinning the plants to 6 to 9 inches apart and application of fetilisers were recommended. This year, despite the decreased area under paddy, an area of 4,300 acres has been brought under the Japanese method as against 1,950 acres in 1953-54. The highest yield recorded is 85 maunds per acre in Udaipur district, as against an average yield of 15 maunds.

Some cultivators apprehended that the Japanese Method of Paddy Cultivation was very costly and could be practised only on small holdings.

That an extra income of about Rs. 190 in the form of extra production of 30 maunds of paddy could be obtained from each acre cultivated under the Japanese method is being realised day by day. And its principles can be adopted with advantage, in case of other crops as well. Low seed-rate, proper spacing of plants, adequate manuring, clean cultivation and protection of crops from pests and diseases are now being regarded as sure ways to higher yields and increased profits.

SAURASHTRA

A few decades ago, the acreage of paddy in Saurashtra was only a few thousand acres. Today, paddy occupies about 80,000 acres. Of this area, nearly 97 per cent is drilled on account of the fact that the average precipitation is only 20 inches. The remaining acreage is transplanted, which is confined either to fairly high rainfall area or to tank irrigation in Nalkantha area.

To study the comparative yields of paddy by the Japanese method, as well as by the local method, 82 demonstration plots were laid out in 43 centres in different parts of the State during 1954. These plots consisted of :—

(a) Japanese method in toto *versus* ordinary drilled method.

(b) Modified drilling method with all aspects of Japanese method *versus* ordinary drilling method.

In Sorath district, where the improved drilled method was compared with ordinary local method, the yield of paddy was on average nearly 70 per cent more than the local method. Transplanting gave 75 per cent higher yield than the local method. In the other districts of Madhya Saurashtra, Halar, Gohilwad and Zalawad, the yield by the modified Japanese method was 50 per cent higher than that by the local method, which gave on an average, 1,200 lbs per acre.

To popularise the Japanese Method of Paddy Cultivation, meetings of officers and fieldworkers were organised at district and taluka level and the method was fully discussed.

Articles dealing with the modified Japanese method and its achievements were published in *Vikas*, an agricultural magazine, and other daily and monthly periodicals. Leaflets on the new method were printed and distributed to the farmers. Posters were also put up at important places, where cultivators happened to assemble in large numbers. In addition, flannel-graphs and film-strips were widely used to popularise the Japanese method effectively.

An "agricultural improvement week" was celebrated when the Japanese method was explained to cultivators, Demonstration trials were conducted on Government farms and cultivators' fields, so that cultivators could actually see, understand and adopt the various improvements. Fertiliser trials with paddy were conducted on cultivators' fields to popularise the use of chemical fertilisers, namely, urea, ammonium sulphate, mixed fertilisers, superphosphate, etc. The results indicated that nitrogen in the form of urea plus superphosphate gives 50 per cent higher yield, whereas urea alone gives a 20% higher yield.

Paddy mixture consisting of two parts groundnut-cake, one part ammonium sulphate and half part superphosphate was prepared and sold to cultivators, towards which the Government has been giving a subsidy of Rs. 2-8-0 per B. maund to popularise the use of the mixture. The Government gives subsidy to co-operative societies and registered dealers who carry out the work of preparation and distribution of the mixture to the cultivators. Through such organizations manure has been made easily available to the cultivators.

Besides taccavi loans from the Government, the co-operative banks in the State provide short-term credit to

cultivators to enable them to carry out improved agricultural techniques.

Progressive farmers in each taluka are registered and are given advice and instruction from time to time by agricultural workers. Many of the farmers have adopted the modified Japanese method and have thus set examples to others.

The Japanese method was modified and made suitable to the conditions of the State. Cultivators have realised the value of the new method in increasing the yield. Nearly 20,000 acres have been brought under the modified Japanese method. The average increased yield per acre is 10 B. maunds; the yield by local method being 17½ B. maunds, thus securing 7,143 tons of additional production of paddy.

Looking to the enthusiasm of the cultivators towards the modified method, there is hope for furtherance of the campaign on a more sound basis. The modified method has also shown the way towards increasing the yields of other crops.

TRAVANCORE-COCHIN

1953-54: From the time of the broadcast talk on the Japanese Method of Paddy Cultivation by Dr. Panjabrao Deshmukh, Union Minister of Agriculture, on January 10, 1953, the ground was being gradually prepared for the inauguration of a campaign in the State for widely publicising the method amongst the farmers and persuading a good number of them to give a trial to this method in a small portion of their fields during the "Viruppu season".

Directives were issued to the district agricultural officers and agricultural inspectors of the department on February 3, 1953, asking them to lay out trial plots in the departmental farms at Nagercoil, Addor, Alwaye and Trichur and to arrange for demonstrations in 200 small plots belonging to cultivators, distributed as widely as possible. In the S.N.D.P. Exhibition held at Quilon during March, 1953, a small plot was laid out in front of the agricultural stall demonstrating transplantation of seedlings in lines with proper spacing, and using only two to three seedlings per hill. The assistant director of agriculture addressed a large audience at this exhibition, detailing all the features of the Japanese method and explained how

they could copy most of them with modifications to suit local conditions and increase the yields of paddy crop.

The State Government issued orders to the Director of Agriculture, that the Japanese system of cultivation should be introduced among the farmers and that necessary propaganda for this objective should be planned and carried out. The Director was asked to prepare small leaflets based on the general principles of the method, with suitable adjustments regarding seed, manures, etc., in the light of local experience, for wide distribution amongst farmers in the State. Arrangements were also made for the prompt supply of compost, manures and fertilisers to the farmers, who take up the new system of cultivation. All heads of departments and offices were given instruction to co-operate with the Department of Agriculture and make the campaign a success.

A delegation consisting of Shri Pranlal Kapadia and three others of the Kora Kendra, Bombay, arrived at Trichur on February 28, 1953, and gave practical demonstrations of the new method. This was attended by many of the officers of the Agricultural Department, Community Projects and prominent agriculturists.

Arrangements to teach the method to farmers were made in the paddy farm, Nagercoil and Central Farm, Trichur.

The campaign was officially inaugurated on March 15, 1953, and all essential steps to convey information to the largest number of farmers in the State were taken. Meetings and group discussions with farmers were carried out by the district agricultural officers and agricultural inspectors of the department. Two thousand coloured wall-posters were exhibited in village centres, where agriculturists usually congregate for marketing, etc. Seven thousand five hundred copies of leaflets in Malayalam and 2,500 copies in Tamil, describing the method in simple, lucid language, were distributed. Flip-books and flannelgraphs were used by the extension officers of the Department as effective aids in their talks with agriculturists. Film shows were arranged in a number of farmers' congregations, with the help of the Department of Public Relations. The latter department collaborated with officers of the Agricultural Department in conducting campaign in a most effective manner. A special bulletin on the method was also published by the Department of Public Relations and thousands of copies distributed to the public.

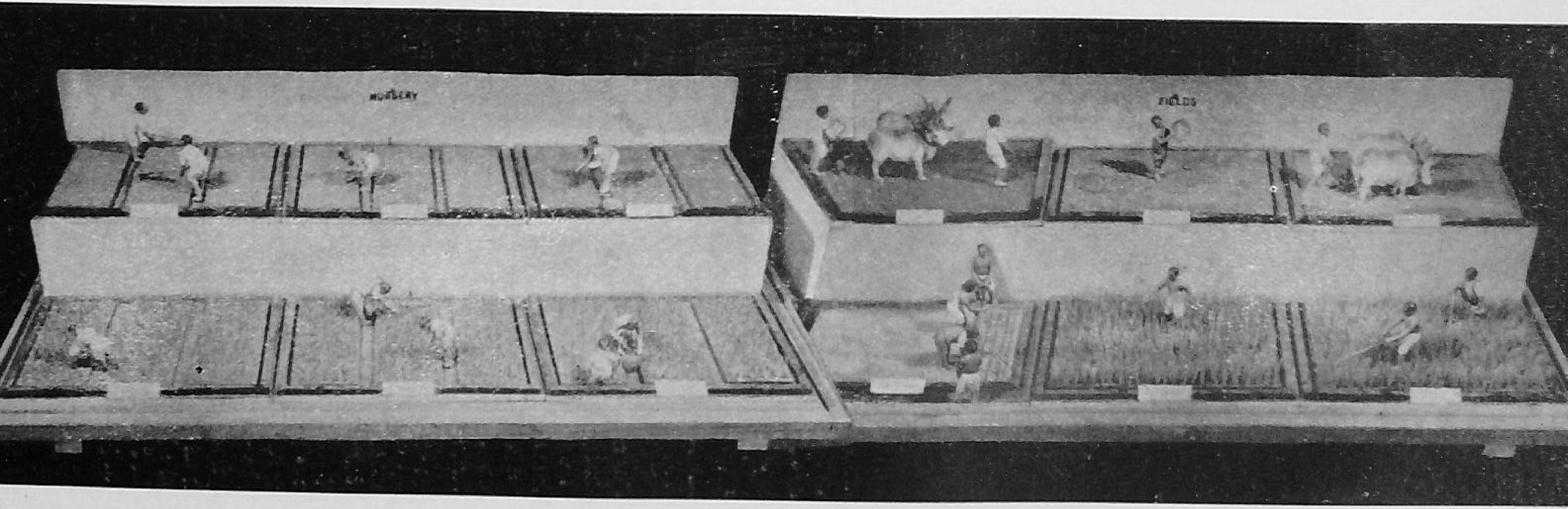
1954-55 : Encouraged by the success of the efforts tried out in 1953-54, the Department of Agriculture set about launching a more intensive campaign in 1954-55. The celebration commenced with a broadcast talk by the Director of Agriculture on March 15, 1954. This was followed by the observance of a Japanese Campaign Week from April 5 to 11, 1954. During this week meetings of cultivators were organised in all the 548 panchayats in the State, at which the experience gained in the method during the previous year was explained in detail by officers of the Agricultural Department. At these meetings, the imperative necessity of bringing as much land as possible under the system during the ensuing year was stressed.

Many of these meetings were addressed by the cultivators, who had undertaken trials in the previous paddy season and had gained some practical experience of the different processes. Booklets in Malayalam and Tamil, on the lines published and distributed in 1953, numbering about 10,000 in all were printed afresh and distributed widely. Film shows were arranged by the Department of Public Relations.

A target of 20,000 acres was fixed for 1954-55. This target was broken up among the four districts of the State. The Trivandrum district, which possesses more assured water supplies through the Kothayar Irrigation System, was allotted 8,000 acres and the other three districts of Quilon, Kottayam and Trichur allotted 4,000 acres each. These district figures were again broken up into taluk targets amongst the 36 taluks in the State ; and these were further apportioned among the different panchayats. Every one of the 548 panchayats in the State was, therefore, intimately associated with the conduct of the campaign and the achievement of solid results. Five thousand acres were brought under the system in the "Viruppu season" of 1954.

In addition to carrying out educative propaganda, practical demonstrations and training in the method, the Government of Travancore-Cochin provided necessary facilities for the farmers to take up the improved system without any difficulty.

Arrangements were made to sell urban compost from all municipalities at the cheap rate of Rs. 6 per ton, and to give priority in its distribution to paddy growers taking up the new method.



Two interesting models of a nursery and a field showing various processes involved in the Japanese Method of Paddy Cultivation. These models were displayed at the four-day exhibition organised by the Union Ministry of Food and Agriculture at New Delhi.

Manures and fertilisers were arranged to be distribdted so that all farmers could have them at their cultivation sites. During the two years, 1953-54 and 1954-55, there was a net-work of depots—consisting of 40 depots directly run by the Agricultural Department and 400 depots run on agency basis—catering to all the requirements of the farmers in every corner of the State. Twenty thousand tons of fertilisers and concentrated manures were distributed in 1953-54, compared with 14,662 tons and 16,557 tons, respectively, in the previous two years.

Groundnut cake and bonemeal were issued at 75 per cent of their cost for both the years 1953-54 and 1954-55. The manures and fertilisers were issued on credit on the croplloan system.

Seeds of green manure crops such as Dhincha, Sunnhemp, *Sesbania Speciosa* and *Glyricidia maculata* were distributed at nominal prices by the Department in these years. The expenditure incurred in this connection was Rs. 7,639-13-0 and Rs. 4,33-0-0 in 1951-52 and 1952-53, respectively.

About 5,000 maunds of paddy seeds of the improved strains Cochin I, MO, MO-2 and ASD-1 have been distributed during these years.

Besides distributing the usual agricultural implements at half-price, Japanese types of hoes were distributed free for demonstrations and use by the farmers. The Department induced local manufacturers of agricultural implements to construct hoes on the Japanese model and some of the firms have already begun to market their products.

The Plant Protection Service has been organised efficiently with members of the staff distributed in every taluk of the State. Sprayers, dusters and material for application are moved rapidly to infested centres in vans specially maintained for the purpose. About 95 tons of materials were distributed in 1953-54 at half rates.

Paddy crop competitions have been organised in both the years to induce growers to put forth their maximum effort ; 484 paddy growers participated in the competitons in 1953-54. District and taluk prizes of Rs. 250 and Rs. 10 respectively were awarded to the successful competitors for each of the three paddy seasons of the year. Similar prizes are to be given in 1954-55.

Demonstration plots have been arranged to be run in each of the 548 panchayats in the State. These plots will be half an acre in extent and will be run entirely at Government expense. A special staff of demonstrators, one for each taluk in the State, has been appointed for the purpose of carrying out these demonstrations,

TRIPURA

On June 4, 1955, a conference of field workers was held at Agartala with a view to popularising and extending the Japanese Method of Paddy Cultivation in Tripura. The number of demonstration plots proposed to be laid out in 1955 was 186. More demonstration centres are also being opened this year.

Sixtyfour maunds of improved quality *aman* paddy seed have already been distributed on Sowai system. In addition arrangements have been made to sell ammonium sulphate to cultivators on a no-loss-no-gain basis, and to supply pumping sets for irrigation. Leaflets explaining the Japanese Method of Cultivation have also been distributed free to cultivators in the State.

UTTAR PRADESH

The Japanese Method of Paddy Cultivation was introduced in Uttar Pradesh in 1953-54. Taking into consideration the irrigation and other facilities available, 29 districts in the State were selected for the purpose. A target of 93,700 acres was fixed for the year, but due to certain difficulties, especially the non-availability of irrigation water during the critical period, it was not possible to have more than 35,000 acres under this method.

The experience gained in 1953-54, and also the trials conducted both on Government farms and cultivators' fields indicated that by adopting this method an additional yield of about seven maunds per acre over the ordinary method could be obtained.

During 1954-55, the same 29 districts were selected for intensive cultivation of paddy. A target of 1,01,119 acres was fixed and the actual achievement was 70,584 acres.

In order to intensify this method in 1954-55, a joint conference of the heads of the various agricultural depart-

ments and workers was held. The difficulties of the previous year were solved. Some of the district agricultural officers expressed their inability to persuade the cultivators to grow nurseries on raised beds. Since the main idea of the Japanese method of raising nursery is to supply water from the sides, it was considered that raising of beds was really not very essential, provided the other operations indicated in the method were followed. It was, therefore, decided that wherever the cultivators had any objection to growing nurseries on raised beds, they should be asked to raise it on flat beds, provided they dug a shallow channel all-round the bed for irrigating the nursery plants. The targets for the year 1954-55 were, therefore, divided into two categories, that is, raised seed-beds and flat seed-beds.

The method was further popularised by training the field staff and laying down demonstrations in the cultivators' fields. Demonstrations were laid out on Government and private farms where irrigation facilities were available. During the course of demonstrations, the Deputy Minister for Agriculture, Uttar Pradesh, as well as the various officers of the Agriculture Department connected with paddy cultivation, visited these places, held meetings of the cultivators and explained to them the usefulness of the method in detail.

The cultivators who had tried the Japanese method in 1953-54 were also invited to participate in these meetings and narrate their experiences. A committee was organised in each district to popularise this method, and full advantage taken of the public workers in the various districts, such as Faizabad, Mirzapur, Unnao, Deoria, Banaras, Kanpur and Lucknow, who proved of great assistance in the campaign.

Circulars from the Development Commissioner to the district magistrates for organising the compaign, and instructions for imparting training to the field staff were issued from time to time. About 300,000 copies of three special publications in Hindi were printed and distributed in all the districts, besides publicity material received from the Government of India. Five hundred copies of flannel-graph pictures, 3,000 copies of flip-books in Hindi and 40,000 posters were distributed all over the State.

Through the courtesy of Mr. Hansen, F.A.O. expert in Uttar Pradesh, an original Japanese inter-cultivator was

obtained. Exact copies of this were made in the Government Workshop, Bareilly, and 167 inter-cultivators were distributed in the 29 selected districts. In addition to these inter-cultivators, the Government of India had supplied 14 paddy weeders for demonstration purpose. Demonstration with these were carried out in 29 districts. The Government of India had, in addition, supplied 11 prints of 16 m.m. films in Hindi entitled "How to Grow More Paddy". These films have served a every useful purpose and have been shown at almost every exhibition, kisan mela and rural gatherings in the State.

There was a visible increase in the use of sulphate of ammonia for paddy cultivation. During the three years preceding 1953-54, about 35-36 thousand tons of sulphate of ammonia were distributed annually; the figure went up to 48,000 tons in 1953-54 and about 50,000 tons in 1954-55. Although it cannot be said with certainty that all this fertiliser was used in paddy cultivation, there is little doubt that quite a major portion of it was utilised for this purpose.

A number of problems emerged during the course of working of this scheme such as :

(a) Uptake of nutrients by the rice plants during the nursery stage and during the period of growth in the field ; (b) effect of trace elements in these stages ; (c) effect of diffrent strength of brine solution on the growth of paddy ; (d) effect of pruning of roots and shoots on the growth of the crop ; (e) method of raising nursery for the paddy crop ; (f) effect of different type and doses of fertilisers in different paddy-growing tracts of Uttar Pradesh ; and (g) cultural investigation in relation to lodging, etc.

These problems have been taken up by the research officers of the Agriculture Department for solution. The results of these investigations are to be published in the form of a popular bulletin.

Trials to test the merit of the Japanese Method of Paddy Cultivation on the cultivators' fields have been carried out in 15 districts. Five cultivators have been selected in each district and given a subsidy of Rs. 40 each, in order to encourage them to take up this work.

A number of crop-cutting tests were conducted on the fields of cultivators who had adopted the Japanese Method of Paddy Cultivation. The data obtained have been submitted to the Chief Statistician of the Agriculture Department for analysis. The result of the crop-cutting tests will be included in a separate bulletin.

VINDHYA PRADESH

Among the food crops of Vindhya Pradesh, paddy is the most important. It commands the highest acreage and production. Out of 26 lakh acres of the cultivated area of the State, paddy is grown in about 12 lakh acres. The greater portion of this paddy area lies in the Baghelkhand division of the State, comprising the district of Sidhi, Sahdol, Satna and Rewa. Most of the paddy in this State is grown by broadcast method and very little is put under transplanting.

Due to the efforts of the Department of Agriculture and, more so, with the introduction of the Japanese Method of Paddy Cultivation, the paddy-growers have realised the usefulness of transplanting. Manuring, too, was an uncommon feature with the cultivators of this State and the use of fertiliser was almost unknown. However, with the introduction of the Japanese Method of Paddy Cultivation, the farmers have realised and become conscious of the usefulness of transplanting and manuring.

1953-54 : The Japanese Method of Paddy Cultivation was introduced in the State in the *kharif* season of the year 1953-54. Wide publicity was given to the new method by distributing free pamphlets stressing the various stages of the Japanese Method of Cultivation. Demonstration plots on the cultivators' fields were arranged. Individual and mass contacts were made by the personnel of the department to convince paddy growers of the usefulness of the new method.

A target of 1,500 acres was fixed, and 1,453 acres were actually sown by this method. An average yield of 26 maunds per acre was obtained, whereas with the indigenous methods the average yield obtained is 17 maunds per acre. This was encouraging, and the cultivators agreed to follow this system in the next season.

1954-55 : In the year 1954-55, every effort was made to increase the area under the Japanese Method of Culti-

vation. A target of 25,000 acres was fixed. Twenty thousand pamphlets on the Japanese Method of Paddy Cultivation were published by the State Department of Agriculture in Hindi and were distributed free to the cultivators.

One hundred and seventy-eight tons of the improved varieties of paddy seeds, 5392 maunds of ammonium sulphate, 2750 maunds of superphosphate and 2380 maunds of fertiliser mixture were distributed among the cultivators. Twenty rotary weeders were purchased for distribution and trials ; 470 demonstrations were laid out on the cultivators fields.

In spite of all the efforts, the desired results could not be achieved because of the limitations beyond human control, as agriculture in Vindhya Pradesh is dependent upon rainfall. Unfortunataly, in 1954-55, the rains came late and, consequently, the seed beds could not be prepared in time and at very many places where the seed-beds could be prepared, the seedlings withered away for want of rain. The State had, therefore, only 2,600 acres under the Japanese Method of Cultivation.

The State Government had decided to award prizes on the Japanese Method of Cultivation, but due to delayed rains the response from the cultivators was poor and the scheme could not be implemented.

Regarding future programme, the State Government propose in 1955-56 to advance loans to the cultivators to meet the cost of raising paddy seedlings under the Japanese method. It is also hoped that projectors with accessories will be used in the districts of the State for exhibition of film strips in the villages.

WEST BENGAL

1953-54 : Intensive groups and mass meetings by the agricultural and extension officers were arranged explaining the advantages and techniques of the Japanese Method of Paddy Cultivation well ahead of planting time.

Fifty-two meetings were held in State farms and other places in the 14 districts of the State. At these, instruction was imparted to the farmers in the techniques of the new method. Numerous other meetings were held by the sub-divisional agricultural officers, agricultural inspectors and

Union agricultural assistants. The progresive farmers from the adjoining localities were invited to attend these meetings and they were paid actual fare for their travel.

Large-scale distribution of posters, pamphlets, flannel-graphs, film strips, etc., was made in order to mobilise public opinion towards the advantages of the new method.

Arrangements for demonstrations in cultivators' own plots were made. The agricultural demonstrators held meetings to explain the results achieved by the new method and for helping the farmers in following the technique of Japanese Method of Paddy Cultivation. These centres of demonstration were also regularly visited by the agricultural inspectors from time to time.

Ammonium sulphate, super-phosphate and fertiliser mixture for paddy cultivation were made available to the the farmers either on cash or on loan, to be repayable either in cash or in kind through a chain of depots and sub-depots opened in rural areas by Government appointed commercial firms. A small quantity of Dhaincha seeds were supplied to the cultivators at subsidised rates for green manuring.

1954-55: The campaign was further strengthened by giving 50 per cent subsidy to demonstration plot-owners in the shape of manures, implements, etc. During this year there were about 2,400 plots.

Thirty-nine agricultural graduates were also appointed as Japanese Paddy campaign officers for three months for intensive propaganda and demonstration of the method.

In 1954-55, about 50 film-strips, two films and 56 sets of slides on the Japanese Method of Paddy Cultivation were supplied to sub-divisions. The sub-divisional agricultural officers in collaboration with the officers of the Department of Publicity made elaborate arrangements for showing these films, film-strips and slides to the rural people. About 100,000 folders giving instruction in the method of application of manure have also been distributed, besides posters, pamphlets and flannel-graphs relating to the Japanese method. The regional officer for the Japanese Method of Paddy Cultivation, Government of India, lent a helping hand in moving round the State and instructing people about the new method.

Regarding the programme for future, the State Government are making similar arrangements for the campaign during 1955-56. A mobile exhibition van has already been set apart for giving demonstrations in rural areas.

CHAPTER VI

INTERNATIONAL INTEREST

International interest in the Japanese Method of Paddy Cultivation, which India was launching to step up her rice production, was already noticeable by 1954.

The condensation of an article by Shri Suresh Vaidya in the September, 1954, issue of the *Reader's Digest*—the full version had appeared in the *Christian Science Monitor* of Toronto, earlier—touched off fresh interest, on a world-wide scale, on India's Rice Revolution.

The *Reader's Digest* condensation read :

"Laxman Mali, of Nasik, Western India, gazed open-mouthed at the ripening rice. He had been a farmer all his life, but he could not recall a single year when his crop had been so unbelievably big. Later, when the harvest was in, the Ministry of Agriculture at New Delhi informed him that he had beaten the world's paddy record with 17,500 pounds per acre. Never before had any man gathered that much rice from his land.

"Overnight, Laxman Mali became a national hero; Not far behind him, however, were 33,999 other Indian rice-growers whose produce last year made history, with yields ranging from 3,000 to 14,000 pounds to the acre. This was not just sensational news, but a vital national contribution to India's rice-eating, perpetually rice-short, millions.

"The record yields resulted from using, on the richer soil of India, a simple method of sowing and planting learned from Japan. The new method requires the Indians to use no new implements, no complicated techniques. The one special requirement is a small amount of chemical fertilisers, available on loan from the Government if necessary.

"From the national point of view, what the new-method farmers produced was phenomenal : an additional million tons of rice. For 50 years India had imported two million tons of rice annually, mostly from Burma. Now

rice imports for her immediate needs have been stopped, and she is looking for a foreign customer to take some of her fine quality rice.

"Like many revolutionary events, the innovation came about through accident. Pranlal Kapadia, a businessman from Bombay, had lived in Japan for 18 years; exporting silk and machinery. In 1941, at-the outbreak of war, he had to leave Japan. Back in India, he enlisted in the cottage industries movement of Mahatma Gandhi, and was made secretary of Kora Gramodyog Kendra, an institute near Bombay. Thirteen of the institute's 28 acres were devoted to rice cultivation : here, Kapadia learned something about growing rice.

"He was about to return to Japan in 1948, when a typhoon hit the Bombay region, leaving the rice crop floating in the fields. It was a severe loss for the institute. When Kapadia arrived in Japan he told a banker friend of the havoc. The banker asked, 'Have you ever heard of a Japanese rice crop being lost through typhoon ? Kapadia hadn't.

"The grain must not touch water', the banker explained. Your problem is to help the stalks stand up by stringing a line for them to rest on'. Why didn't such a simple thing occur to rice-growers in India, Kapadia wondered.

"The following October, when Kapadia was back in India, another typhoon flattened Kora Gramodyog Kendra's paddy crop. Kapadia led his co-workers into the field, stuck bamboo poles on either side and stretched a line between them. But the plants were not in straight rows—in India, sprouts are transplanted thickly and at random. Kapadia rummaged among the prostrate plants, found four that were in line, rested them against the string. A week later, these four plants were dry and healthy, their grains intact. The rest of the crop had perished.

"Harishchandra Patil, a graduate in Agriculture of Bombay University and a farmer, was impressed by the demonstration. The following year both he and Kapadia transplanted their rice in straight rows, Japanese style. The yield doubled !

"To learn more about the Japanese method, the Bombay State Government sent a delegation to Japan in 1952, of which Patil and Kapadia were members. They

rented a half acre of land and arranged for instruction by Dr. Iwao Kamo, a well-known paddy expert.

"Dr. Kamo taught them to select their seed by dipping it in salt water. Only the heavy seed that sank to the bottom was retained. This was then washed in a bacteria-killing solution and dried in the shade—not in the sun—so that it was ready to germinate when sown thinly. One pound of seed was allotted for their half-acre, in contrast to as much as 300 pounds per acre sometimes required for thick Indian sowing.

"Manure was given to their plot, not all at once, but in instalments, so that—as Dr. Kamo explained—'the plants aren't overfed first and starved afterward. Three weeks later when the sprouts were four inches high, Dr. Kamo gave transplanting instructions: Plant them ten inches apart, each way. The plants need that much space to attain maximum growth.

"Every fortnight they walked between the ten-inch rows, weeding and mixing manure carefully with the soil. When the crop matured it equalled the Japanese yield: 2,000 pounds for their half acre more than five times the Indian average.

"Upon their return to India, Patil and Kapadia adapted the Kamo method to Indian soil, which is richer than the Japanese. They reduced the amount of manure used in Japan by seven-eighths, made up the difference with compost; they planted not two pounds of seed to an acre but eight. They handled everything else as Dr. Kamo had outlined.

"When the harvest came, Kapadia gathered 8,000 pounds to an acre, Patil 12,000. Fifteen hundred other farmers who had followed their example reported similar results.

"Kapadia and Patil showed Government experts a film they had made of the new method in operation. The Minister for Agriculture, Dr. Panjabrao Deshmukh, himself of peasant stock, was impressed by the scheme. He ordered a countrywide campaign to publicize it.

"In the spring of 1953, the Ministry of Agriculture distributed truck-loads of illustrated pamphlets in 75,000 villages. Whenever possible, movie vans, with teams of explainers, showed the method on film. Thirty-four thousand Indians joined the experiment.

"The monsoon season of 1953 was the do-or-die test. The new method emerged triumphant in every respect. This year, rice was taken off the ration list, and the price began to slide for the first time in 12 years.

"This past summer two million acres of India's paddy-land went under the new system—only two million, because there weren't enough demonstration teams to go round. But it is sure to go on spreading, all over India's 75 million acres of paddyland.

" 'The new method has revealed to us the potential of the Indian soil', said Dr. Deshmukh. 'We shall exploit it to the full.'

"Most important is the effect the programme is having on the Indian farmer himself. Always he had eked out life on one meal a day and regarded poverty as a divine phenomenon. Now that is changing. Ambitious self-confidence is sounding the knell of traditional fatalism."

Queries about India's new experiment in rice production came from countries as far apart as Greece and Brazil. Reproduced here are a few letters :

Letter dated August 3, 1954, from Mr. Vernon Elledge, Attorney-at-Law. Second National Bank Building, Houston 2, Texas, U.S.A. :

"I notice in the local newspapers a report that farmers in India, using new methods prescribed/by the Government, have greatly increased their production of rice, and that production of 8,000 pound per acre is not out of the ordinary.

"It will be appreciated if you will send me any literature you may have that is printed in English which will give the methods advocated by the Government which resulted in this high rate of production".

Letter dated September 23, 1954, from Mr. Gholam Ali Rodd, Department of External Affairs, Government of Iran, Tehran :

"I have read recently in American magazines of Your Excellency's highly successful efforts in the achievement of world-record-yields in rice culture in India. I have had one of the articles translated into Iranian and have submitted it to His Excellency Adl, our Minister of Agriculture, with the suggestion that if we were to follow suit we also

could probably achieve for Iran what Your Excellency has achieved for India.

"With this object in view and in the interest of our international relationship, I should feel extremely grateful if you would instruct to have sent me copies of the illustrated pamphlets and literature you have had printed for the guidance of Indian farmers in adopting Japanese methods of rice culture. If any of these were available in the English language it would be an added advantage.

"Your Excellency is doubtless aware that Indian methods of rice culture are more or less the same as those of Iran, and it is our common belief that either we derived our rice culture methods from you or you derived your methods from us; and or we both (partially at least) derived our methods from China".

Letter from Manila, dated September 24, 1954, from the Legation of India :

"We would be grateful if you could kindly send us some copies of the pamphlet illustrating the Japanese method of rice culture which, we believe, have been distributed by the Ministry".

Letter, datelined Camp Murphy, Quezon City, October 6, 1954, from Lt.-Colonel Arturo De Los Reyes, General Headquarters, Armed Forces of the Phillipines Research & Development Division :

"I read with full interest an article in the September issue of the *Reader's Digest* entitled "India's Rice Revolution". I learned, too, from said article that as Minister for Agriculture of India, you caused the widest publication in your country of the highly successful rice planting method adopted by Messrs. Harishchandra Patil and Pranlal Kapadia as learned by them in 1952 from Dr. Iwao Kamo, a well-known Japanese paddy expert.

"In view of your Government's outstanding achievement that literally revolutionized your national rice production level to the extent of attaining self-sufficiency in the short span of two years and in view further of my desire to try your system of rice culture in the Phillipines, may I request your kindness and benevolence to furnish me with as complete, accurate and comprehensive literature, preferably with data and pictures, on your aforementioned method of rice culture? The article in the *Reader's Digest* was so condensed that one could not even attempt

to try the method as described therein. Such information as the concentration of the brine solution for selecting the desirable seed, the kind and strength of sterilizer solution used, the kind and amount of fertiliser applied per acre and such other detailed material to enable one to try the method as published would be most welcome".

Letter dated October 7, 1954, Okinawa, Ryukyus Islands (Gibraltar of the Pacific), from Mr. Soter S. Tusalem, RCA Communications, Inc. P.O. Box 19, Goeku.

"This may come as a surprise to you Doctor, since I am a Filipino citizen writing to you instead of to our own Secretary of Agriculture. However, what prompted me to write you is an article I read in the issue of the *Reader's Digest* of September 1954, page 159, a condensation of an article orginally published in the *Christian Science Monitor*, by Suresh Vaidya about "India's Rice Revolution."

"I am 31 years old, and though with no previous agricultural experience, would like to be a farmer. I have bought some 16 hectares of land in Mindanao, Phillipines, and will be going home early next year to cultivate it myself. I am very much interested in the new way your people cultivated their rice and raised their yield several times better than the old method which is no different from the Phillipines method.

"I understand your Ministry of Agriculture has distributed illustrated pamphlets regarding this new method of production, and I would like to try it on my land. I have thought of writing to the author of this article, but on second thoughts, you can help me more fully with this problem on account of your official position. I would like very much also to get the address of Dr. Iwao Kamo, who. I believe, originated this method of production. I would like to thank the author and the *Reader's Digest* through you, if that is possible, and I would sincerely appreciate your help in airmailing me one of those illustrated pamphlets, or if you can refer me to one of your young farmers, I would be very glad to correspond with them and between us little people, we probably can help in whatever little way we can, to help other people understand that democracy, which strives for peace and the free flow of ideas between democratic countries, is still better than Communism.

"My respects to the Honorable Prime Minister, Mr. Nehru, to you and to your people."

Letter dated October 18, 1954, from Mr. Buenaventura C. Lopez, Secretary, The National Rice Producers' Association, 2nd floor, Phillipine Bank of Commerce Building, Plaza Sta, Cruz, Manila :—

"In a July, 1954, issue of the *Christian Science Monitor* and in the September issue of the *Reader's Digest*, there appeared an article by Mr. Suresh Vaidya, entitled "India's Rice Revolution". Mention is made of an eight-page illustrated pamphlet distributed by your office to explain to rice growers how to improve their production of paddy by applying the Japanese method.

"Our Association is very much interested in securing copies of this pamphlet and such other literature on rice which you can spare to send us. Our country has an average production of 27 cavans of paddy per hectare, each cavan weighing 44 kilos. This year we may import up to 200,000 tons of clean rice, clearly indicating that we are still very far behind in our rice production. Our goal is to be self-sufficient in our local supply to ensure us that the sad experience we suffered during the Japanese occupation may not be repeated due to insufficient supply of this vital cereal.

"We, therefore, solicit your kind co-operation in sending us at your earliest convenience the above-mentioned literature and also your permission to reprint them here in the Phillipines."

Letter dated September 20, 1954, from Mr. Dominador Magabilen, 3-A, Washington St., Bacolod City, Phillipines :—

"Kindly send me your pamphlet (illustrated) on your new paddy rice culture which has enormously improved your rice production. I am a rice farmer and I am very interested to know about this new rice culture. For the sake of humanity and good neighbour policy, I pray that your goodself will not hesitate to send me the aforesaid literature. If it is for sale, please send me by C.O.D."

Letter dated October 7, 1954 from Mr. A. Gokal Ladha. P.O. Box 29. Astrida, Ruanda Urundi, Congo :

"I have been given to understand that your Ministry has been kind enough to instruct many rice growing people the proper method for growing rice.

Dr. Iwao Kamo, Professor of Paddy Agricultural College, Iwata, Hamamatsu-shi, Japan.

"Since I am much interested in your new method and (will) be benefited by it, I would deem it the greatest favour if your goodselves would kindly oblige me by sending me its details together with the illustrated pamphlets."

Letter dated September 22, 1954, from Mr. Ranjit-Singh Sahota. P.O. Box 666, Dar-es-Salam :—

"I shall be glad if you would supply me with the illus trated pamphlet describing the new 'RICE PRODUCTION METHOD' now used in India."

Letter dated November 16, 1954. from Fomento Agricola Mexicano S.A. Balderas 31. Mexico 1, D.F :

"We read an article in the September issue of the magazine, *Reader's Digest*, which had been condensed from one published by the newspaper, *The Christian Science Monitor*, entitled "India's Rice Revolution", and written by Mr. Suresh Vaidya.

"Upon reading Mr. Vaidya's article, we were amazed at the yield of rice per acre in your country after having adapted the Japanese method to local conditions.

"Mexico produces and consumes a lot of rice. Conditions in our country are similar to yours, and we feel that perhaps we could also adapt the Japanese method as you have already admirably done so.

"Being an agricultural company, we are naturally very interested in your new, rice-growing method. We have lands on which rice is planted, but the yield per acre is, of course, nowhere near the yield in your country. Therefore, we would greatly appreciate it if you would be so kind as to send us copies of the pamphlets, instructions, etc. that were distributed by your Ministry to your farmers as mentioned in Mr. Vaidya's article. It is needless to say that such a method adapted to this country would be an immense improvement over the already established rice-growing methods and would improve the quality and quantity of our production".

Letter dated November 9, 1954, from Mr. Rolf Herz Calxa Postal No. 5982, Sao Paulo, Brazil :

"In one of the recent issues of the *Reader's Digest*, I read an article condensed from a publication in *The Christian Science Monitor* by Mr. Suresh Vaidya, regarding the exceptional results obtained in India through a revolutionary method of rice-planting. Being a small farmer

myself and interested in testing this method on my soil, I take the liberty to herewith approach you with the request to be kind enough to let me have some copies of the illustrated pamphlet published by you and any other additional information you might be able and prepared to disclose.

"I trust that this pamphlet gives information regarding, for instance, the concentration of the salt solution for the selection of the seeds, an exact plan on the application of manure (are there now chemical fertilisers being used?) etc. I would appreciate it if you could also send me one pound or so of rice seed which gave the best results over there".

Letter dated November 15, 1954, from Mr. F.S.C.P. Kalpage, 17, Aponso Avenue, Dehiwala, Ceylon :—

"I read with interest in the *Reader's Digest* of October 1954, of the improved method of rice cultivation which is said to have given remarkably good yields in India. Could you please let me know whether the details of this method have been published in any scientific or other journal and if not, how I could contact some of the people concerned with a view to finding out some details of the techniques employed."

Letter dated November 15, 1954, from G. Andreadakis, Noel Avenue No. 14, Iraklion-Crete (Greece):

"In last September's issue of the *Reader's Digest*, page 137, and under the heading "INDIA'S RICE REVOLUTION", I came across an article condensed from *The Christian Science Monitor*, which describes a new system of rice-growing applied in India and thanks to which, Mr. Laxman Mali, of Nasik, of Western India, has beaten the world's paddy record with 17,500 pounds per acre.

"The marvellous feat may be attributed to some extent to the potentiality of the Indian soil, as Dr. Deshmukh has declared, but it is mainly due, according to the article referred to, to the new method of sowing and planting.

"The article further mentions that your Ministry of Agriculture had at the time distributed truck-loads of illustrated pamphlets. Would you have the kindness to let me have one, in English, if available, or any other printed matter explaining the new method you have followed?

"Successful rice-growing in Greece, which, as you know, is a very poor country, shall be of extreme impor-

tance, and I shall be grateful if you would decide to be of assistance to me in this matter".

Letter dated November 19, 1954, from Mr. Jwalla P. Somwaru, Plantation Albion, Berbice, British Guiana, to the Commissioner for the Government of India, in the British West Indies, Trinidad :

"I have read with much interest about the new techniques in rice cultivation which are being promoted by the Ministry of Agriculture of the Government of India. As our climate and soil texture in this country are very much like those of India, I have thought of trying out such methods over here. I shall, therefore, be very glad if this Commission will oblige by obtaining for me from the Ministry of Agriculture such bulletins and pamphlets, as well as illustrations, as are supplied to the public through the offices of the said Ministry.

"I have noted that in the new scheme of things, the Ministry has to some extent modified the original Japanese method, in that compost and other manures are substituted for certain chemical manures. As we may have to resort to the use of chemical manures over here, I shall be glad to obtain from the Ministry the specifications of the types and proportions of the chemical manures used in the original Indo-Japanese projects.

"As preparations for our spring crop would have to commence by the early part of next year, I shall much appreciate your communicating with the home office by air mail, requesting, if necessary, a reply by such service ; I would be prepared to remit any extra cost involved in such communication."

Letter dated November 18, 1954, from Mr. Jose-Oroceo, Mombasao, Capiz, (Philippines) :

"Thank you very much for the pamphlets which you sent me a week ago. Now I can go on with my project although I have to leave out yet some of the methods now being in use in your country about the much-wanted Japanese system of paddy for rice-growing.

"There is one thing I wish to know conerning this new method of rice culture and it is about the variety of rice planted in India. Please let me know of it and how I may secure the same. I am ready to remit an amount if you can only arrange for me an order of, say, eight pounds of seeds of an Indian variety. I am bent on following to

the letter the instructions found in the pamphlet. There is yet time to prepare for the next planting season, which will be in April, May, and June next year.

"I am of the opinion that what has been done in your country could also be done here, and if in the event my projected experimental venture will succeed, I hope you will be too willing to hear from me of the results."

Letter dated December 22, 1954, from Mr. Julio R. Arellano, General Manager, CIA Agricola Del Caribe, S.A. Officios No. 104, Habana-Cuba :

"The writer is a rice-grower and agricultural engineer and read with great deal of interest the article published in July 19, 1954, issue of *The Christian Science Monitor* regarding "INDIA'S RICE REVOLUTION." This article explains the experience of India's rice experts based on the Japanese method of rice culture.

"Will you be kind enough to air-mail the writer the pamphlet on the experience of your rice experts.

"I enclose herewith $ 1.00 for postage. If there is any extra charge for the pamphlet please let me know so that I can remit same to you immediately, Thanking you in advance for giving this matter your prompt attention and with my sincere congratulations on the success attained by your experts in the cultivation of rice."

Letter dated November 14, 1954, from Mr. Joe Gazo Jr., 801 E. 10th. Little Rock, Arkansas:

"I read an article by Suresh Vaidya that Laxman Mali of Nasik, raised 17,500 pounds of rice per acre—a world record.

"I would like to know what he had done to achieve that record, what variety of paddy he planted and if I could get some of it, Let me know what the cost will be for a few pounds. I would like to see how it does in our climate and soil."

Letter dated December 24, 1954, from Mr. Juan P. Torres, Ph. D., Chief, Agronomy-Horticulture Division, Bureau of Plant Industry, Manila:

"We are deeply moved with special interest in the improvement you have made on your rice industry about which we have read in the September, 1954, issue of the

Reader's Digest. The new method of rice-growing that you have adopted is, indeed, a revelation to us and we are looking forward to do likewise in our country if we shall know more of the details.

"Please furnish us a copy of your brochure and circulars of instructions to the farmers for our reference and we should like to obtain if you could send us about 100 gms. of seeds each of at least 3 to 5 rice varieties that you are growing that produce 200 or more cancans (one cancan equals £ 3. 6 kilograme) of rough rice per hectare, for observational tests in the Phillipines.

"We shall furnish the report of the results of the study, if so desired."

The Editors of the *Reader's Digest,* too, sent a very appreciative letter. It read:

"Your influence in increasing the rice production in India will benefit farmers and consumers throughout the world. We are grateful to be able to present your agricultural methods to them through our international editions."

The Union Minister for agriculture, Dr. Panjabrao Deshmukh, acknowledged this letter on November 26, 1954, saying:—

"It was a matter of immense gratification to me to receive your letter. I am thankful to you for your generous appreciation of my efforts in increasing the rice production in India.

"I am inclined to believe that the introduction of this method in India on a countrywide basis for the first time in 1953-54 will be considered an epoch-making event in the history of world agriculture. Besides my personal efforts in directing the campaign and those of my Ministry, I was lucky enough to secure a very large measure of cooperation from my colleagues, the Ministers of Agriculture in the States, their officers and last but not least the rice-growers of India. The two Indian pioneers who brought the method to India also laboured hard in giving demonstrations at various centres in the country. And yet we had not a few obstinate and doubting Thomases in the country who were so hard to be persuaded. There was also an amount of indifference, if not positive aversion, on the part especially of those whose duty it was to propagate new methods but had never been able to make any impression on the people.

"With God's grace and considerable human endeavour on the part of a large number of people, we achieved a success far in excess of our expectations. If you are interested, I could supply you with more details of the actual results obtained, which strengthen my conviction that the propagation of this method is bound to benefit farmers and consumers throughout the world—a conviction you have yourself expressed in your letter. Towards this attainment, the publication in your so-widely-circulated a journal has been a great asset.

"We have planned during the current year on a somewhat larger scale and, in spite of unprecedented floods and drought conditions in many parts of the country, I think our efforts will bear still greater fruit attaining still higher yields.

"Encouraged by the facts and figures of the results of the first year's campaign, I made bold to assert during my recent visit to Japan and especially at the fifth session of the International Rice Commission that if what we did in India could spread to the various rice-growing countries, rice production in Asia should be ahead of growth of population, because it is apparent that except Japan, followed by Formosa and South Korea, the yields in other Asian countries leave ample scope for betterment."

A short paper entitled "A Memory Preceding India's Rice Revolution" was sent by Dr. Iwao Kamo, the Japanese Rice Expert to the Union Minister for Agriculture, Dr. Panjabrao Deshmukh. This interesting document said:

"The article "INDIA'S RICE REVOLUTION" which appeared in the *Reader's Digest*, September 1954 issue, must have been a surprise not only to me but also to all who had read it.

"At that time I had thought it was only the stupendous exaggeration of the editor of the magazine. In October, however, having been given an opportunity to meet Minister Deshmukh, who was then attending the International Rice Commission Conference held in Tokyo, I learned from him that the article told the fact ; a big increase had been made in rice crop. The surprise now turned into a great joy. Indeed, it is a joy almost inexpressive, to realize that the Japanese technique of raising rice has now something to do with the welfare of 300 million people in India.

"Here I shall write some of my memories of the time when the inspection delegation sent by the Government of

Bombay was here, and wish to extend it my sincere New Year's greetings.

"It was in April, 1951, when I first heard that the inspection delegation sent by the Government of Bombay was coming to Hamamatsu. As Mr. Uchiyama, a good acquaintance of Mr. Kapadia, the leader of the delegation, lived in Hamamatsu, his residence was offered as their headquarters. They stayed there for a few months, during which time I came to have the pleasure of meeting the visitors from the far country.

"I first met Mr. Kapadia and the other delegates on May 8, at Agricultural Department of Shizuoka University where I work. They came just to meet me and extend goodwill, in spite of the fact that the school is situated in Iwata City, about 12 Kilometres away from Hamamatsu. Although it was a gloomy rainy day, they wore a happy expression in their eyes, the brightness of which I can never forget even to this date.

"I had already known that the main object of the delegation was to study cottage industries in Japan, but at this first interview, I came to know that Mr. Patil, a member of the delegation, was especially interested to learn the Japanese technique of raising rice. It is, however, next to impossible to master the practical technique by only lectures and theories, so I made up my mind to have Mr. Patil experience in the field the technique of raising rice through various stages from seeding to harvesting.

"Mr, Uchiyama's residence, namely, the temporary headquarters of the delegation, and its neighbourhood being on a hill, there are dry fields but no paddy fields nearby. It is desirable to set a seedling bed where one can observe and take care of it every day, so we prepared a little plot in Mr. Uchiyama's yard, irrigated it with city-water, thus completing a seedling bed and seedling process. Mr. Patil, of course participated himself on bare foot, in preparing the bed and setting seeds. I have heard that in India they sow seeds very thick, so I think by actually setting seeds himself in the Japanese way, for instance, at the rate of 100 gr. per 1 m 2, Mr. Patil could well get the idea of proper seeding.

"Unfortunately, I was too busy to look after the bed every day, but, as Mr. Patil, except when he was away on his trip, never missed a day in taking care of it, the result was remarkable, the seedbed yielding fine strong young

seedlings. At the end of June, we rented some paddy field at a distance of about ten minutes on foot from Mr. Uchiyama's residence, and planted the seedlings there. In the early part of July, we gave supplementary fertiliser and also carried out weeding. Mr. Patil participated in all these processes. In Hamamatsu, it is about 17 degrees Centigrade in the middle of May, and about 22 degrees even in the latter part of June, which are perhaps temperatures one never experiences in Bombay. Therefore, it must have been quite trying for Mr. Patil to enter paddy fields barefooted and work, and I was a little worried when he told me the next day of sowing that he had been feeling unwell. However, his earnestnees got the better of his cold, and he was well again.

"In the temperate zone, rice yields once a year, but in the tropical or sub-tropical zones it is possible to crop rice twice a year. For example, in Formosa, over 750,000 acres out of the total area of 1,100,000 acres of paddy fields yield rice twice a year. Even the air temperature is suitable ; however, such a method of yielding cannot be adopted, unless there is the advantage of sufficient and convenient irrigation. The reason why only the single yielding method is widely practised in the tropical zone in Asia is due to lack of artificial irrigation.

"In Japan, single yielding is generally adopted. but double yielding is used in some parts of Kochi prefecture. In view of the comparatively low temperature of Japan, limiting the period of growing rice plants, only the perfect combination of the three facts, *i.e.*, complete irrigation facilities, improvement of variety and the cultivating technique, will make double yielding possible and bring out a success.

"Thinking that actual observation would serve as a great reference to the future development of raising rice yields of India I took Mr, Patil to Kochi prefecture. We left Hamamatsu on July 8 for an inspection trip, and spent the 10th and 11th observing the ripening stage of the first crop of rice in several places.

"In the paddy fields of Kochi prefecture, they can crop rice not only twice a year, but they utilize the land by very complicated rotation to such a high degree that they crop agricultural products two or three times yearly (of course, including rice). This may not be necessary at present in the case of India which has a vast territory ; but I believe that the method of combining well-thought-

out human deviced and skillful techniques with natural environment gave him a good reference as to how to increase the produce.

"In the beginning, Mr. Patil had intended to stay until the end of October to complete his practical work, but as the other members were to finish their work at the end of August and return to India, it became necessary for him to decide either to stay here alone or go home without observing harvest and the drying process. Fortunately, however, I had been working on double cropping of rice since a few years ago, and I had rice plants, raised in a little plot, which was to be harvested at the beginning of August. I took him to my research paddy field on August 2, and showed him the Japanese method of harvesting and the method of drying rice plants called "Haza-boshi". In this way Mr. Patil completed his observation and study of the Japanese methods of raising rice in each stage from seeding to harvesting. actually participating himself in the work. He accomplished his original aim of practical work thus in a short period of time.

"Mr. Patil called on us often at the University, I too called at their headquarters often, and we talked about the subject. But reading books and hearing lectures alone would not have given him the actual knowledge and technique. Practical work is what helps most. The fact that the Japanese methods of cropping rice adopted in India have been a great success is, I believe, due to Mr. Patil's proper application of the experiences gained through his earnest practical work.

"My deep impression gained in this experience, which I shall never be able to forget, is the very earnest observation and attitude in the study taken by the leader of the delegation and all the members in spite of the unaccustomed circumstances. The work accomplished by the few members of the delegation may be just as small as a grain of mustard compared with such a large country as India, but I trust that it will grow into a large tree which will shelter birds nests some time in future. Nay, it has already been showing a rapid growth in the last three years,

"In the end, I sincerely hope that the work will continue to show better results and improvement."

Acknowledging the article, the Union Minister for Agriculture, wrote to Dr. Kamo on January 31, 1955.

"I way delighted to receive your letter of the 23rd January, 1955, enclosing a short paper entitled. "A memory preceding India's Rice Revolution". This short paper makes very good reading, and, if I have your permission, I would like to give it wide publicity in India. I would also like to get the photo printed.

"Just for your information I am enclosing herewith copies of the minutes recorded in my Ministry, which will give you a concerted story of the way in which I took interest in this matter. This is, of course, for your personal information only. I am also enclosing herewith a copy each of the two broadcasts I gave on All-India Radio on the Japanese mthod. Earlier to these minutes which began on December 22, 1952, my attention to this was drawn by our President of the Republic of India, Dr. Rajendra Prasad, in a letter dated September 19, 1952. I was sworn in as a Minister on August 13, 1952, and took the earliest opportunity after receiving the above letter from Dr. Rajendra Prasad, of visiting the Kora Kendra; and all this is going to form part of a detailed story which we are thinking of relating. I do not wish to add anything further at the moment. I will certainly send you a copy when this whole story is completed.

"I would also like to know if you would have any objection in our utilizing your short paper in connection with this."

On February 19, 1955, Dr. Kamo replied:

"I thank you very much for your kind letter of January 31, 1955. Moreover, the enclosed copies have delighted me very much, for they gave me good understanding how India's rice revolution has occurred.

"Of course, there is no reason to refuse publicity for my short paper. I shall be very happy if my short paper—A memory preceding India's Rice Revolution—could serve your purpose."

The news of the success of the Japanese Method of Paddy Cultivation in India found a column in *The Nippon Times* of Japan. A reference to this was made by one of the leading agricultural implement manufacturing concerns of Japan, the Central Commercial Co., Osaka, in a letter dated December 14, 1953, to the Minister for Agriculture, Government of India. The letter said:

"Having learned through our newspaper *The Nippon Times,* we sincerely congratulate you upon your success in

producing your rice and other farming produces by adapting our method. Since we are now extensively propagating it throughout the world where rice is produced in order to help increase of it, we are very glad to notice your comments and suggestions therein.

"Since we have published our pamphlet on "Japan Rice Cultivation Method" we have lately found that by planting the young rice shoots in wider space between rows, say about 15 to 20 inches apart and plant them closely to each other in rows, say, about four to five inches apart, the yield of rice is wonderful as they will enjoy more of sun rays, oxygen and nutrition available : it would be easy for weeding and inter-culture taking less labour. Furthermore, they will stand the severe wind and noxious insects well. Therefore, we are now going to revise our publication suggesting the above improvements which eventually coincides with your valuable experiments.

"As we deem it very valuable to have your advice and comments regarding your experiments in compiling future articles in our pamphlet, if we are not asking too much of you, we will appreciate it very much if you are kind enough to favour us by sending your detailed method with your kind suggestions in the above matter.

"In most of the countries in the world over ninety per cent of the population earn their livelihoodly directly or indirectly from the soil; the agricultural produce and its by-products form the basis of the national income and also the foreign exchange so that we can safely say the agricultural enterprises are the backbone of national progress. An increase of agricultural yield in cultivable area depends on adequate water supply, appropriate mechanising of agriculture, proper care of agricultural land and crop pest control with technical assistance, necessary time-saving and economical agricultural machinery, equipment and implements.

"As you will see in our pamphlet we are aiming to utilise indigenously produced materials, such as grass, straw, husk and even earth, as much as possible for fertilisers and infection economically for self-sufficiency and to rationalise farming.

This was acknowledge by the Union Minister for Agriculture on January 12, 1955. Dr. Deshmukh replied :

"Thank you for your letter dated the 14th December, 1953, and enclosing therewith a pamphlet on the Japanese

Rice Cultivation Method. I am very glad to tell you that our experiments have been very successful and highly encouraging. We have asked various States in India to send us details of what they have done and on receipt of this information I will see if I can send you a summary. In the meantime, please accept my thanks for your appreciative letter and the information that you have yourself given me."

The Consulate-General of Japan in Bombay was equally interested in India's efforts to increase her per acre yield of paddy with the Japanese pattern. A pamphlet on Japanese cultivation methods was sent by the Consulate-General to the Union Minister for Agriculture.

The pamphlet published by the Central Commercial Company, Japan, was found to contain some interesting information which could possibly be adapted with certain modifications for propagation in India. It was, therefore, decided to have 2,000 copies of the bulletin from the Japanese firm through the Embassy of India in Japan for making a detailed study of the working of the method in Japan and India.

CHAPTER VIII

ACHIEVEMENTS—AND THE FUTURE

The countrywide campaign for promoting the Japanese Method of Paddy Cultivation had fared well in the first year of its inauguration. For its promotion in the second year, even the experience of the first now stood in good stead.

On April 25, 1954, the Minister for Agriculture addressed the Opening Session of the Crops and Soils Wing of the Board of Agriculture at Bangalore. The utility of the Japanese Method and its achievements were, among other important items, discussed in detail at the meeting.

The Committee felt that the campaign had produced satisfactory results and had generally led to the achievement of higher average yields per acre. In the opinion of the Committee, *ad hoc* campaigns of this nature catch the imagination of the farmers and the public and provide an effective instrument for stimulating crop production. The committee wished to emphasise, however, that any centrally directed campaign could not be promoted on a uniform pattern of recommendations for general adoption by farmers throughout the country. It was, therefore, of the opinion that schedules of improved cultural and manurial practices based on certain common and fundamental factors must be suitably modified in the light of the results of local research and experience to suit local conditions. The Committee wished that this important point should be clearly understood by the State officials through whom such campaigns are promoted, and that it would be their responsibility as in the previous year's campaign, to modify, in the light of the proven results of their own research and experience, the broad recommendations made by the Centre. The Committee agreed that the campaign should be continued with greater vigour.

Other recommendations made by the Committee were :—

That a major obstacle in the way of carrying the results of research to the farmer and the widespread dissemination of improved practices established by research

and field trials was the lack of adequate organisation and machinery to ensure supplies at the right time at the door of the cultivators of the materials which he needs to adopt the recommended practices. Lack of adequate short-term credit was also a factor holding up the large-scale adoption of the recommendations of research. The Committee, therefore, stressed the building up of adequate and effective machinery to ensure that the wherewithals of development were available to the farmers at the right time in adequate quantities.

The Committee suggested that the heavy doses recommended for the nursery may be modified to suit local conditions, although it agreed with the recommendations in respect of narrow and raised seed-beds.

In regard to field manuring, the Committee agreed that while the use of organic manures was commendable, in view of their non-availability in adequate quantities and other practical difficulties, use of fertilisers in prescribed doses should be advocated along with whatever organic manures were available. In the opinion of the Committee, varieties have been bred and selected to give largely increased yields and it was obvious that such varieties make heavier demands upon the soil's resources and, therefore, the maintenance of sufficient supply of plant food in the soil was a very important consideration.

The Committee advocated the wider use of bone-meal and stressed that steps should be taken to ensure its availability in adequate quantities, particularly in the areas where it had given good results.

The Committee felt that adequate research on a regional basis was essential to get correct information on the the items included in the cultural and manurial schedules, as also to ascertain to what extent each of these factors contributed to the increased yields.

The Committee felt that adequate research on a regional basis was necessary to evolve suitable varieties which will withstand heavy doses of manuring and will not lodge.

The Committee agreed that there should be close liaison between the plant protection and the campaign agencies in order to ensure that all the necessary plant protection measures receive adequate attention.

The Committee felt that inter-culture operations were conducive to higher yields and advocated such operations in all the States except Madras, where further trials should be made. It recommended that inter-culture implements suited to the different paddy-growing areas, should be designed and introduced after trial.

These recommendations were communicated to the State Governments on July 3, 1954, by the Indian Council of Agricultural Research.

While in Tokyo to attend the Fourth Session of the International Rice Commission in October, 1954, the Union Minister for Agriculture met the President of the Central Commercial Company, Ibaraki Osaka-Fa (Japan) with whom he had been in correspondence for some time.

The Company had sent a copy of their publication, entitled "Wave shaped rice cultivation method." It read

"Despite the fact that, due to the disastrous typhoon and floods, all over Japan, the rice crop has decreased almost half, (but) certain paddy fields where the new and revolutionalised method of the Wave Shape rice cultivation method was adopted the rice crop was not damaged but brought an usual good crop and rather increased. As we believe that it will surely and eventually help increase the rice production in the foreign country, we strongly recommend to adopt this particular method as it requires less seed, fertiliser, labour and water in paddy fields and will stand well the noxious insects and disease, because, it thus will stimulate and encourage more healthy and vigorous seedlings to grow, bearing better and more grains when mature. The secret of this particular method is to grow the seedlings with two or three paddy seeds in one spot in group on the nursery bed in shallow water, and when they bring three or four leaves cut the roots from another group grown on the opposite side of rows by some kind of knife or sickle so that the roots will not mix up with another group which will also facilitate to take off from the bed. Special attention should be paid when transplanting them into paddy fields as follows :—

"In order to give them more space of sun rays and the oxygen from the air to grow them very healthy and strong, the transplanting should be done in the South to North direction in row giving a large space between rows, say at least two feet wide, and closer in line about three to four inches apart between them so that scraping, weeding,

cultivating and ridging can much easily be done than in the old method.

"Plant the seedlings 1 or 2 groups in 1 spot in line in a slant direction and do not plant deep but very shallow, and you will be quite surprised to find how soon they will stand straight and start growing briskly.

"Five days after transplanting, in order to help growth of outer leaves of the seedlings the scraping of soil should be done closely to them in order to help grow their roots vigorously. This will surely stimulate them to yield more grains. It should be done in any event.

"Ten days after transplanting, intercultivate between rows by the Weeder or Cultivator in early morning and evening not in hot day time as it is liable to hurt the roots. Give them heat in day time and keep them cool in night.

"Fifteen days after transplanting, hill up the seedlings in line with soils by ridging between the rows say at least 1 inch deep in centre of rows. At this time if they are grown with 15 branches in each plant the yield will be very heavy. It is said that the ridging at this time will be worthwhile just same as if they were given 9 pounds of sulphate of ammonia. Because it will assist them to absorb more of fertilizer and oxygen. Repeat the ridging 20 and 25 days after transplanting covering the roots of seedlings at least 1 inch at a time so that 4 to 5 inches in depth. This will help them to grow very strong, stout and healthy with more vigorous roots and bring a good fruit of crop of rice.

As you will see the condition of the Paddy Fields where the rice is cultivated will become same as the "Wave of Sea", so that it is called "Wave Shaped" Rice Cultivation.

SPACING BETWEEN ROWS AND EACH PLANT IS THE KEY TO RAISE RICE CROP

"More you give the space between the rows and closer in line, more you can get the crop of rice when the seedlings are replanted in paddy fields. The following table will show you the results :

TABLE OF CROP RICE PER ACRE.

Spacing between rows of Rice Plants	Spacing between Seedlings in line	Results of Harvest of Paddy Rice
1 feet 6 inch	4 inch	5,424 lbs.
2 feet 6 inch	2.5 inch	8,532 lbs.
3 feet 6 inch	2 inch	10,184 lbs.

The Union Minister for Agriculture felt that there was much sense in what had been described as the "Wave Shaped rice cultivation method" and desired that it might be tried on some plots by way of experiment and demonstration.

On November 26, 1954, the Union Minister for Agriculture held a meeting of the Special Committee to review the working of the crop campaigns in the country.

The Committee recommended that :

1. All campaigns should be the responsibility of the Agricultural Extension Commissioner with the collaboration of the Information Wing of the Indian Council of Agricultural Research.

2. The implementation of the campaigns was ultimately the responsibility of the States concerned. In 1953-54, areas of the campaign were limited, while during 1954-55 the area proposed was much more vast than that in the previous year. Greater concentration, therefore, was necessary and that was possible only if the States could participate fully in the matter.

3. Campaigns should be mounted one at a time, although it was essential to plan and programme a series of campaigns which could be mounted, one after the other. Whenever a campaign was mounted, the best available specialist on the subject of the campaign should be recruited to take full charge of the collection and approval of scientific and improved farm practices under the general supervision of the Extension Commissioner.

4. The local variations were important factors and that information on various improvements from local experts should be taken for preparing any material for the campaigns.

5. Every State ought to have one person responsible for the campaign and necessary expenditure in this connection should be borne by the State concerned. It was also pointed out that a team of officers of the Centre, headed by a senior official, should go down to one or two major States in the first instance, and arrange a full discussion with high State officials and settle the organisation necessary at the State level for successful implementation of the campaigns.

At the International Rice Commission held in Tokyo in October 1954, the Union Minister for Agriculture, Dr. Panjabrao Deshmukh, took a leading part in the deliberations of the Commission. Most of the delegates had only a vague idea of how India had secured higher yields of rice by the adoption of the Japanese method. They were eager to have a clear picture of the steps India had taken to revolutionise her rice production. Both Dr. Panjabrao S. Deshmukh, Minister for Agriculture, Government of India, and Sri S. C. Roy, Agricultural Extension Commissioner, explained to the delegates in detail the campaign undertaken by India. The various incentives provided by India for the greater use of fertilizers was commended by the Commission.

On January 10, 1955, the Union Minister for Agriculture, in a broadcast from All India Radio, Delhi, said :

"I could not let the 10th of January pass without addressing my listeners. Exactly two years ago this evening, I broadcast my very first talk on All India Radio, preaching the Japanese Method of Paddy Cultivation. I had moved in the matter as fast as the circumstances permitted. As you may remember, I was sworn in as Minister on the 13th of August, on the Gopashtami Day of 1952. On the 19th September, the President, Dr. Rajendra Prasad, wrote to me drawing my attention to the experiments under the Japanese method conducted at the Kora Kendra at Bombay under the Gandhi Memorial Fund Organisation. I accordingly visited Kora Kendra soon after and started the study of the Japanese Method of Rice Cultivation in right earnest. When I went to Calcutta some time later, I found that the Director of Agriculture

of West Bengal had tried to preach this method in Orissa' several years ago, but he could make very little headway.

"Even the Kora Kendra people tried their very best to popularise it, but many so called experts and people in authority turned a deaf ear to it. Many others opined that there was nothing to learn from it, and that the indigenous methods having been tried for generations and centuries were the best, and even if any improvement was necessary, it was all well known to the Department of Agriculture and veteran farmers. But as the visit to Kora Kendra and further actual study of the method convinced me of its original character at least in certain respects, I had decided to push on forward.

"On the 7th of January 1953, I was called upon to preside over the Food Ministers' Conference in the absence due to illness of the late Sri Rafi Ahmed Kidwai. I referred to the Japanese method there and suggested if it might not be possible to loan to the rice-growers a maund of ammonium sulphate to be repaid with one maund of rice. Although this was not accepted straightaway, the need for making available fertilisers on loan to the rice-cultivators was recognised, and accordingly a sum of Rs. 8 crores was set apart for this purpose. Similarly, the price of sulphate of ammonia was reduced from Rs. 365 to Rs. 290 per ton. All this is now part of the history of Indian agriculture. But it is as well to remember the main events. Recounting them on this day, the third anniversary of its propagation would, I hope, therefore not considered inappropriate.

"In the very first year the Government of India spent hardly a single pie excepting what was spent on getting the various publicity material ready. The campaign was inaugurated on the 15th of March 1953 over the whole country. On this day I broadcast another talk and so did many of the State Ministers of Agriculture. Although this was the first campaign of its kind, the response, in spite of the opposition of some and doubt, reluctance and suspicion of many, was splendid. Many officers of the Department of Agriculture in the various States took the keenest interest and the Kora Kendra people went round the whole country in organising demonstrations. They had also asked for a large sum of money from the Gandhi Smarak Nidhi, but actually they hardly spent even half a lakh.

"But the campaign gathered considerable momentum and a large number of peasants came forward to give it a trial. In 1953-54, i.e., in the very first year of the campaign, we were able to cover more than four lakhs of acres on which we got an average production of 38.72 maunds per acre. This works out at 3302 lbs per acre as against our average production of less that 700 lbs per acre and the Japanese average of 2250 lbs per acre. It should be remembered that our average over 50 years ago was above 900 lbs per acre, but this had progressively declined till it came down to as low a figure as 643 lbs per acre in 1951-52.

"I do not think anybody would contend that, now that we are self-sufficient in most foodgrains, and surplus in rice, we need not worry ourselves much about the campaigns. I do not worry with such a point of view, because I do not wish to be complacent to any degree. We have also the uncertainties of monsoon always to dread and face. We must, therefore, keep ourselves always alert because it is not unlikely that good production of one year may be more than absorbed by another lean year that may succeed it.

"It may also be argued that larger production may result in further fall in prices. But I consider that the prices are falling is an important reason why we should increase production. Although there is some relationship between larger prices, an average cultivator, if he has to keep his head above water, must try to make good his losses due to falling prices by larger production. I therefore hope that nobody would slacken efforts in the way of striving to increase production in India which even with the progress that we have made, continues to be one of the lowest in the whole world.

"Secondly, it is important that we should do what we have done in the case of paddy with respect to other crops as well. It is highly gratifying that from the beginning I appealed to people to apply, as a matter of pure common-sense agriculture, the essentials of the Japanese Method of Paddy Cultivation to at least such crops as maize, *bajra*, *jowar*, cotton, etc. and I feel proud to say that the people have not been slow in taking up the suggestion. It is also well to remember how we were badly bitten in the case of the production of sugar as well as jute. After reaching the level of our requirements, there was a steep fall in production leading to large

imports of both. In cotton we have made remarkable progress and we hope to keep it up. But none-the-less we have yet much ground to cover and therefore there is much room for the kind of campaign that we organized for paddy in 1952-53.

"I therefore do not wish that we should allow any slackening of our efforts. We cannot also forget that although we may have produced sufficient for our present needs, we have yet to provide adequate nutrition to our people. This is unlike the old Grow-More-Food campaigns and other activities when we wanted to eat less not eat what they liked, We preached foregoing of meals and asked people to spare rice.

"In the case of the Japanese method also, there are quite a few ideas that have come up. I want these ideas to be studied carefully by the various Agriculture Departments in the States and adopt them with or without modifications as may be considered necessary under their own conditions without delay. The Japanese themselves are perpetually adopting newer methods. They have recently sent me what is described as the "Wave Shaped Rice Cultivation Method". This "Wave Shaped Rice Cultivation Method" was sent to me in a note by the President of the Central Commercial Company of Japan. It has been stated in the note that with a spacing of 18"x4" the yield obtained was 5424 lbs; with 30"x2½", 8532 lbs; and 42"x2", 10184 lbs.

"I view all these activities with considerable confidence, generated especially by the success we achieved in the propagation of the Japanese Method of Rice Cultivation. Even in this field there is still ample scope. I do not think we will attain the somewhat excessive target of 2 million tons during the current year 1954-55. The information so far received gives us a total of only 5½ lakh acres, but we might easily double our figure of the year 1953-54 by the time all the rice crop for the year 1954-55 is reaped. But even if we reach a target of only one million acres, our achievement would cover only 1-1/3 per cent of the total area under paddy since it was 76.6 million acres in 1953-54. Of course, even this small and insignificant percentage makes a tremendous difference, because the yield in most cases is anything between 4 to 10 times as much.

"Even so, I would suggest that even those cultivators who have taken to it, may practise it on as small an area as

10'x10'; I am sure for such a small area there could be neither any difficulty about labour, nor about fertilisers. In fact, I would not even advise them to use fertilisers, provided they use good manure prepared out of night-soil and urine. If every cultivator who has not yet practised the Japanese method, practises this on this insignificant area, it will not only give him larger yield, but convince him of the efficiency of what we are preaching.

"I am aware that there are many areas where cultivators are forced to resort to broadcasting. Even in these cases I would like the cultivators to resort to transplanting over as much area as possible. In extreme cases, experimenting with instantaneous transplanting may also be tried. This is, of course, only for those who cannot under the peculiar circumstances do better than what is suggested here. As a matter of fact, there should be no difficulty even in cases where broadcasting has to be practised, to resort to transplanting in lines at least over a portion of the field, give it the manure and fertilisers which are prescribed and do the hoeing and weeding as suggested under the method.

"There is, therefore, a great deal more work ahead for us all in trying to convince the agriculturist to practice these above methods, and to see that no cultivator is left who does not experiment by himself on a limited piece of land. Similar things could be prescribed so far as all other crops are concerned. Cotton could be planted with more and wider spacing, could be given more manure and fertilisers, and the same could be tried in the case of such crops as jute, wheat, sugarcane, etc.

"For all these reasons I thought it worthwhile reminding you of what we did in the past, and tell you about the success we attained. I am sure everyone of you would agree with me that we cannot afford to take things easy. We must strive ceaselessly for a long time to come so that we meet all our growing needs of agricultural produce. It is only thus that we would place ourselves out of dangers of scarcity and emerge as a stronger and healthier nation."

Broadcasting another talk on campaigns for better cultivation from All India Radio on February 15, 1955, the Union Minister for Agriculture, referred to the Japanese method and said :

"Although I addressed my listeners on the anniversary of the first broadcast on the Japanese method of paddy cultivation on the 10th January last, I consider it necessary

to celebrate as widely as possible the next anniversary of the intensive drive to propagate the improved methods of agriculture. This was first done on the 15th March, 1953, for the Japanese Method of Paddy Cultivation and I wish that what was done then and repeated last year should be repeated on the 15th March, 1955, with still greater vigour, with better preparation and wider appeal.

"At the informal meeting of Ministers in December last, the view was expressed by some Ministers of Agriculture that the Japanese method was now so well on its way to popularity and was spreading so fast that nothing much need be done by us at present. I did not feel much convinced then and feel a little disillusioned now. This is based on the reports about the acreage put under the Japanese method during the current agricultural year, *i.e.*, 1954-55, and what I observed in Madras and Andhra. It appears unlikely that we will attain even half of the target of two million acres we had fixed for this year. It is apparent the target was unrealistic and excessive like our previous Grow-More-Food schemes. Secondly, it is apparent that the progress is disappointingly uneven from State to State. While Hyderabad and Mysore have done a marvellous job of it and exceed the target fixed several times over, and States like Bombay and Coorg have fulfilled their targets, I cannot say the same with regard to many of the other States. I have no hesitation in claiming that what we have achieved is a veritable wonder unprecedented in the history of Indian agriculture, and yet I do not consider it wise that we should rest on these achievements of ours.

"It is my confirmed view that we must continue to press forward the propagation of all possible methods of better cultivation with all the zeal, enthusiasm and earnestness at our command. In view of the unevenness of the progress and the fact that there is ample room for the spread of these methods, I request all concerned to undertake another full-throttled drive, beginning with the 15th March, 1955, and to demonstrate the method in as many places as possible, especially in areas where it is yet to be seen by the cultivators with their own eyes."

The second anniversary of the campaign for the Japanese Method of Paddy Cultivation came round on March 15, 1955. The opportunity was used by the Union Minister for Agriculture for another appeal to the nation. He said :

"This is the third time I am broadcasting on the 15th March. It was on this day in 1953 that we undertook the experiment of the Japanese method on a countrywide scale, on a scale unknown and unprecedented in the history of Indian agriculture. It is worthy of note that, owing to the size of our country and the number of our people, quite a few of the things that we undertake tend to become world records. When I say this I naturally have in view particularly our tubewell project and the reclamation work done by the Central Tractor Organisation. The reasons which led us to organise a drive for this method are now so well known to all.

"Last year we celebrated the first anniversary on this day, and we were then able to demonstrate how these campaigns were fruitful by the concrete achievements to our credit. All the same, and in spite of the strange calamity of falling prices that we are facing today, we cannot relax or slacken our efforts. We are just self-sufficient in our requirement of rice. But being so is not enough. We must produce and continue to produce extra food so that we are not taken unawares by natural calamities like floods and droughts, pests, and diseases, rusts and frosts, locusts and rats. We should also be alive to the problem of our ever increasing population. It is, therefore, my most earnest desire that, for many years to come, we should continue to press forward the popularisation of improved practices of cultivation and apply them not only to paddy but to all major as well as even minor crops grown in our country with full zeal and enthusiasm.

"Although work of such a kind and magnitude had never been organised in our country, I was sure, at the very start of the campaign, that, if it was to be a success, it should, while based on the foundation of our valuable experimental evidence and the results of research available in the different parts of the country, answer the touchstone of the experience of our good farmers which extend over centuries. That our approach to the problem was in no instance dogmatic but rational and practical has been fully corroborated by the results of the campaign for the past two years for which the campaign has run. It is also now incontrovertible that all the items we preached in the Japanese method were never in their totality practised in any one place in India, because the results we have achieved under this method, in innumerable instances, were never even heard of much less obtained before. There are some people who would not admit facts. But we need not concern ourselves much about them.

"In the year 1953-54, when the campaign was first started, the acreage under the method was over four lakh acres, This showed that we had made more than a satisfactory beginning. We chalked out a plan of action with the help of both officials and non-officials. Many State Ministers and officials gave their sincere co-operation to the Gandhi Smarak Nidhi workers headed by Shri Pranlal Kapadia and Harishchandra Patil in the grand work of demonstration and training that they carried out all over the country. It was thus that we attained the very high figure of over four lakh of acres in 1953-54, *i.e.* in the very first year of our effort. It is most gratifying that the increase in yield per acre has been phenomenal all along, and the potentialities of the method are now beyond doubt. The average yields over large compact blocks as high as 5,000 to 6,000 lbs and more per acre were harvested in many places. Individual yields in many states were higher still. But as I have often said, we are more concerned with better averages reaped by thousands of farmers and not so much with only a few getting very high yields although the latter stand out as very encouraging examples,

"The very first year's experience, therefore, confirmed my belief and strengthened my resolve that what was really required was well-organised and well-directed drive for stepping up of the per acre yield of different crops by popularising some of the well-established improved practices by cultivation, which, in many cases, need no further experimentation and trials, but only slight modifications in the light of local conditions. While exploiting the wealth of research accumulated with us, I firmly believe that commonsense is as great an asset as anything else. In the very first circular letter that I wrote to my colleagues in the states, I dwelt on the excessive seed-rate that our farmers generally use. It is now patent that this is a matter which requires more attention than had been paid to it so far, and this is applicable not only to paddy but most other crops.

"We have this year. *i.e.*, in 1954-55, covered at least twice the area under the Japanese Method as compared with what we had done in 1953-54. This is much short of the target of two million acres, but is more than enough for our purpose. The main reason why we were not able to reach the target was the widespread and unprecendented floods in Uttar Pradesh, Bihar and West Bengal, followed by droughts extending over vast areas in Bihar

and Orissa. I am satisfied with the achievement because, in spite of the devastations caused by floods and droughts we are still faced with a large surplus which has led to pouring in of bitter complaints against falling prices, not only of other agricultural commodities but rice also. It is to be imagined what would have been the fate of prices if we had no floods and droughts. I would also like my listeners to compare this new situation with what we were facing for years, and as late as about a year and half ago, when the late Shri Kidwai has decided on the policy of progressive decontrol.

"The experiments on the Japanese Method have demonstrated amply that there can be no doubt about the success of these few commonsense hints. There is also our splendid peasantry prepared to respond whole heartedly to our appeal and take all we say in the right spirit. But the responsibility in reaching the man on the plough is ours and it is here that a great leeway, in my view, has yet to be made. We have not only to convey the hints but also enable him by all possible means within our power to practise what we tell. I, therefore, want to request all of you to undertake a full-throttled campaign from today to spread this method to as many farmers as possible by actual demonstration and by other ways as well.

"The Japanese Method of Paddy Cultivation and the campaign in its favour was the first of its kind to be taken up in our country. In the middle of the season we experimented with a similar campaign with sugarcane, although on a very limited scale. And yet we succeeded remarkably, as would be proved by the actual yields obtained by the cultivators as a result of top-dressing with ammonium sulphate. There should, therefore, be no hesitation in extending these campaigns to every possible crop and cultivation by all the departments of agriculture in the States so that we permanently bury our past and unworthy heritage of miserable yields and open up a new era for Indian agriculture when the average yields would be not only much higher than at any time in the past but comparable to what other agriculturally advanced nations obtain. It is for this reason that I wish all my listeners to take pains to convey this message of better cultivation and observe the 15th of March every year throughout the country for the popularisation of intensive and better cultivation method."

The campaign today proceeds unabated throbbing with enthusiastic fervour, taking the contours of a national event.

Indian paddy fields cover nearly 76.6 million acres of irrigated and unirrigated land. Definite targets under the Japanese Method of Paddy Cultivation were laid by the State Governments for the first time during 1953-54, and nearly 2,25,000 villages were selected for the try-out. These were :

S. No.	*Name of State*	*Target laid*	*Achievements (Total acreage under all features of the new method)*
1	West Bengal	11,000	61,839
2	Assam	50,000	30,000
3	Uttar Pradesh	93,700	35,070
4	Madhya Pradesh	5,000	1,460
5	Orissa	2,528	1,242
6	Pepsu	* *	3,727
7	Madhya Bharat	18,910	15,262
8	Travancore-Cochin	1,060	1,060
9	Mysore	20,000	28,070
10	Rajasthan	5,000	1,962
11	Bombay	750	4,553
12	Saurashtra	100	95
13	Coorg	900	933
14	Bihar	3,000	3,180
15	Vindhya Pradesh	1,500	1,453
16	Delhi	3,000	1,500
17	Hyderabad	3,99,240	1,51,966
18	Tripura	50	50
19	Bilaspur	200	13
20	Bhopal	25	100
21	Himachal Pradesh	400	162
22	Kutch	50	20
23	Madras	64,720	13,785
24	Punjab	47,000	38,275
25	Andhra	10,665	5,923

The target laid down by individual states for bringing paddy tracts under the new method has exceeded in several cases.

For the first year, and mainly on cultivated fields more than 400,000 acres were brought under the Japanese Method in which all features of the method were fully practised. About three million acres, it is estimated, were brought under the partial Japanese Method, where intensive use of fertilisers was resorted to along with some of the features of the new method. A number of farmers

tried out this method on other crops as well which was, indeed, gratifying. All of which showed that given the opportunity the Indian farmer does not lack in initiative and imagination and is prepared to take risks.

As the first year was mainly on the basis of extension experiments on a massive scale, helped by good rains and a well-directed campaign, the total influence of the experiment, in terms of overall production may not be considered very strong. However, in addition to other factors, the campaign also helped in increasing paddy production, as can be seen from the production figures since 1949-50. The average yield of cleaned rice per acre based on overall total production in the country was as follows:

Year	*lbs*	*Maunds*
1949-50	688	8.36
1950-51	596	7.24
1951-52	637	7.74
1952-53	582	3.29
1953-54	791	9.61

As compared with 1950-51 figures, in 1953-54 there was increased production by nearly a million tons; and compared with 1951-52, the additional production was 4.6 million tons. It stands to reason that the unusually satisfactory food position in India today is due essentially to the better production of rice. Since an addition of 3.3 per cent more land produced 20.4 per cent more rice as compared that the previous year, that is 1952-53; and the previous average of 637 lbs per acre soared up to 791 lbs in 1953-54. On the basis of production figures, after careful consideration of the figures of yield collected from different fields, it has now been definitely ascertained that the average yield (on the average of 23 States under the Japanese Method) comes to 38.44 maunds per acre.

The average per acre yield under the new method in different parts of the country ranged between 15 maunds, 1230 lbs and 65 maunds (5330 lbs) as against an average yield of 7.8 maunds (615 lbs) to 44 maunds (3608 lbs) under the local method.

The estimated increase in yield on the total average 4.02 lakh acres under the Japanese Method was 13.35 maunds (1095 lbs) per acre. The method has thus conclusively established its potentialities for stepping up India's rice production to a considerable extent.

In the 25 states that had taken up the new method, the estimated additional production was 1,97,000 tons under the full Japanese Method, and about 2,15,000 tons under the partial Japanese Method, thus totalling 4,12,000 tons.

The increased per acre returns in terms of money value under the Japanese Method ranged between Rs. 19 to Rs. 350 in various states *Bihar* benefiting the most.

On a conservative estimate of 200 lbs of fertiliser mixture per acre, it will be seen that over the 34 lakh acres that were under partial or full Japanese Method, roughtly 2,00,000 tons of ammonium sulphate and 1,50,000 tons of super-phosphate were used by the farmers.

The cost of cultivation per acre under the Japanese Method is considerably influenced by the availability of labour, fertilisers, climatic conditions, and other factors. The cost of cultivation for the new method varied from Rs. 78 to Rs. 351 per acre as compared with Rs. 64 to 252 per acre under the local method in different states. In all cases, however, the extra expenditure on the cost of cultivation, due to the employment of the new method, has resulted in additional production, which has more than balanced the extra expenditure, and left a considerable margin of profit to the cultivator.

The names of the first six best performers in each state are given in Appendix II. The highest yield obtained per acre under the Japanese Method in individual cases was recorded at 161½ maunds from West Bengal. The other two states, in order of merit stood, at 145 maunds per acre (Hyderabad) and 132½ maunds per acre (Coorg). The yield varied considerably from state to state, as the conditions of soil, water supply etc., differ from region to region.

In any analysis of the factors leading to the success of the campaign, the following factors are outstanding :

(1) Efficient direction and conduct of the campaign by the Indian Council of Agricutural Research in the first year and by the Ministry of Food and Agriculture in the second year ;

(2) whole-hearted co-operation from the state governments ;

(3) support received from the press in the country ;

(4) magnificient response both from the field workers and farmers ;

(5) energetic and imaginative approach of the Union Ministry of Agriculture ;

(6) vigilance of top leaders like the President and the Prime Minister ;

(7) selfless work and persistence of Kora Gramudyoga workers in experimenting the method and making it available to the country ;

(8) interest shown by the Bombay state government in the initial experiments ; and

(9) good rains.

Due to the spectacular success achieved and the enthusiasm and response shown by the farmers in the adoption of the Japanese Method during 1953-54, it was decided to launch a country-wide campaign on a more extensive scale and bring about two million acres under the method.

The targets laid down for each state for 1954-55 have already been given in the foregoing paras. The current year's crop has suffered heavily in the states of Assam, West Bengal and Bihar, either due to floods and excessive rains or from continued drought conditions. The average crop position is, however, satisfactory.

Reports available from the states show that nearly 12 lakh acres have been put under the new method (Appendix III).

For the 1954-55 campaign, several facilities are being provided by the Government of India. The present indigenous production of nitrogen fertilisers is about 4,29,000 tons of ammonium sulphate. This does not meet the country's requirements fully, and, therefore, in 1954, it was proposed to import 1,00,000 tons of ammonium sulphate. The use of super-phosphate and bonemeal is encouraged by granting subsidies up to 25 per cent of their cost price. This subsidy is shared equally by the Government of India and the state government. Railway freight is another factor which has increased the cost of fertilisers considrably, particularly at places far away from the factory or from ports. To provide incentive to farmers to use fertilisers in greater quantities, railway freight charges have been equalised on an all-India basis and the pool price of ammonium sulphate has been fixed at Rs. 315 per ton delivered at any railhead destination in India.

The incentives for the use of green manure is provided by the Government of India through the Grow More Food

scheme of granting 50 per cent subsidies on green manure seed distributed to cultivators. Here, again, the subsidy is shared by the Government of India and the State Governments on equal basis. All these incentives are expected to result in the increase of area under the Japanese Method of Paddy Cultivation and, consequently, lead to increased production of paddy.

Some up-to-date achievements of the Japanese method were summarised by Dr. P. S. Deshmukh, Minister for Agriculture, in his inagural address to the Fifth Session of the International Rice Commission, held at Calcutta, on November 12, 1956. He said :

"Like our total production of foodgrains, it was in the year 1953-54, that we had the highest production of rice in the country. The total quantity produced in that year was 27.8 million tons. It would not be at all incorrect to attribute at least partially the success of larger production to the introduction of the Japanese method.

"I had referred to this during my speech at the last Session of the International Rice Commission in Tokyo although at that time our experience of this method was rather new. But I am glad to say that during the succeeding period all our expectations of its efficacy and suitability have been more than fulfilled. The acreage under this method has progressively and substantially increased and we are determined to make further efforts to see that a still larger area is brought under this system of agriculture.

"In the year 1955-56, we covered a little over 2 million acres and although we have fixed a target at the end of the Second Five-Year Plan of only 4 million acres, I have every hope that we will soon revise this target and go up to at least 10 million acres. I feed confident of achieving this revised target and my confidence is based on certain definite grounds. First, every cultivator who has practised the Japanese method has found it highly beneficial.

Secondly, a still larger number of others have seen the unheard of yields with their own eyes and thirdly, we have decided to utilise the agency of the National Extension Service as well as the Community Project Administration for this purpose to the utmost possible degree. What our Prime Minister described as a marriage between the Community Project Administration and the Ministry of Agriculture is sure to produce spectacular results. The area I

have been speaking about is the area which is definitely put under the Japanese method as a whole.

"A large number of other cultivators practised one or the other of the items or merely used fertilisers which they had not done before and thus achieved higher production. The practice of the Japanese method as a whole has given additional yield on an average of half a ton per acre,

"At this rate, 10 million more acres under the Japanese method by themselves should give us 5 million tons more production of rice which under the unrevised target of production for the year 1960-61 means half of the total additional foodgrains production aimed at in the last year of the Second Plan. I am glad to mention that the average production per year also has, more or less, since the time we preached the Japanese method, made considerable progress.

"Whereas our lowest production was as low as 550 lbs. per acre we went up to 815 lbs. in 1953-54. Due to very extensive floods in 1954-55. the average went down a bit, but we have recovered some of the lost ground even in the year 1955-56 when the rice area was not again free from large floods.

"The diversity of conditions under which rice is grown in India is perhaps peculiar to this country. We have at one extreme the deep water rices of Assam and Bengal growing in 15 ft. to 20 ft. of water and on the other there are areas in which rice is grown as a dry crop with 25 to 30 inches of rain. Though it does best in heavy loam it is also grown in poor sandy soils, shallow laterite soils as well as in very heavy clays. The crop is grown on lands almost at sea level as in the river deltas, in lands even below sea level with protective embankments and at altitudes of 3,000 to 5,000 feet above sea level. There are rices of 80 days' duration as well as others which may take up to seven months to mature. The crop is also grown in different seasons. This wide range of conditions has naturally led to the breeding and evolution of a large number of high yielding varieties. As a result of investigations carried out at various centres, varieties suitable for different conditions such as flood resistant varieties for Bihar, flood and drought resistant varieties for Bengal, flood, drought and salinity resistant varieties for Orissa and deep water paddies for Assam and Bihar have been evolved. With the introduc-

tion of these improved varieties yields have also gone up from 15 to 30 per cent in different States.

"The recent investigations in Kashmir have revealed the possibilities of growing rice at high altitudes of about 7,000 ft., in place of millets and other coarse grains which grew before. Some of the acclimatised Chinese varieties of rice have also yielded bumper harvests, in that State and given an average yield increase of 60% and more as compared with other imported and indigenous varieties."

As laid down in India's first Five-Year Plan, the target of additional production of paddy has already been achieved-via the Japanese method. A purposive measure, carried out with drive and vision, simple in concept and operation and without scientific conceit, it has succeeded beyond expectations in revolutionising India's rice-paddies. The success it has achieved is not a mere projection of nostalgic anticipations, but direct and immediate. And, in the years to come, the chances are that this method-might make India more than self-sufficient in rice."

PRINCIPAL, GANDHIGRAM, EXTENSION

APPENDIX I

Irrigated & Unirrigated Area Under Rice in India. 1947-48—1949-50

(In thousand acres)

State	1947-48			1948-49			1949-50		
	Irrigated	Un-Irrigated	Total	Irrigated	Un-Irrigated	Total	Irrigated	Un-Irrigated	Total
1	2	3	4	5	6	7	8	9	10
1 Assam	1019	2985	4,004	1137	2871	4,008	1130	2965	4,096
2 Bihar	2866	6740	9,606	2878	6682	9,560	4374	9542	13,916
3 Bombay	257	2240	2,497	235	2181	2,416	308	2853	3,161
4 M. Pradesh	1490	7119	8,609	1506	7257	8,763	1438	7401	8,839
5 Madras	8451	2107	10,558	8256	2179	10,435	8459	2140	10,599
6 Orissa	1422	3976	5,398	1451	4053	5,504	1535	3735	5,270
7 Punjab	231	149	380	238	140	378	313	155	468
8 U. Pradesh	809	7196	8,005	706	7916	8,622	804	8289	9,093
9 W. Bengal	1909	7751	9,660	1847	7609	9,456	2198	7570	9,768
10 Hyderabad	1171	134	1,305	1131	112	1,243	1187	206	1,393
11 J. & Kashmir	440	57	497	352	38	390	424	21	445
12 M. Bharat	32	129	161	36	207	243	48	264	312
13 Mysore	760	9	769	747	31	778	747	31	778

1	2	3	4	5	6	7	8	9	10
14 P.E.P.S.U.	16	23	39	22	15	37	31	8	39
15 Rajasthan	9	8	17	9	8	17	9	8	17
16 Saurashtra	.	9	9	..	9	9	..	9	9
17 T-Cochin	714	323	1,037	717	321	1,038	717	321	1,038
18 Ajmer	(a)	(a)	(a)	(a)	(a)	(a)	(a)	(a)	(a)
19 Bhopal	(a)	39	39	(a)	41	41	(a)	47	47
20 Bilaspur	3	8	11	3	9	12	4	7	11
21 Coorg	5	82	87	6	82	88	7	82	89
22 Delhi	(a)	(a)	(a)	(a)	(a)	(a)	(a)	(a)	(a)
23 H. Pradesh	44	39	83	48	60	108	49	49	98
24 Kutch	—		—		—	—	—		—
25 Tripura	.	390	390	—	393	393	—	381	381
26 V. Pradesh	1	59	60	1	59	60		1097	1,097
TOTAL:	21,649	41,572	63,221	21326	42273	63,599	23782	47181	70,964

(a) Below 500 acres.

Source : *Indian Agricultural Statistics*, 1949-50, Volume I (Summary tables)

APPENDIX II

Yield Per Acre of Rice in India

(In lbs.)

State	Based on official estimates of Production					Based on I.C.A.R. crop cutting surveys				
	1947-48	1948-49	1949-50	1950-51	1951-52	1947-48	1948-49	1949-50	1950-51	1951-52
1	2	3	4	5	6	7	8	9	10	11
1 Assam	943	922	958	783	813	1,001	990	927*	829*	593 890*
2 Bihar	608	639	587	395	463	662	639	438@ 618*	392@ 487*	346@ 492*
3 Bombay	823	684	764	749	577	841	867	800	743	576
4 M. Pradesh	599	593	651	376	603	711	644	790	518	690
5 Madras	924	920	856	920	913	945	966	830	974	975%
6 Orissa	680	441	453	469	555	653	726*	429@ 673*	763*	820*
7 Punjab	563	600	683	645	524					742
8 U. Pradesh	563	628	621	463	398	544	602	479	434	362
9 West Bengal	816	805	844	894	821					
10 Hyderabad	788	654	560	576	657				641%	561% 737%
11 J. & Kashmir	1,640	1,640	747	864	864					
12 Madhya Bharat	545	531	308	223	171					
13 Mysore	752	722	690	761	707				1,290	1,112
14 P.E.P.S.U.		484	632	648	605					

1	2	3	4	5	6	7	8	9	10	11
15 Rajasthan	840	696	310	734	136					
16 Saurashtra	762	339	589	629	510					
17 Trav.-Cochin	931	681	842	842	842					
18 Ajmer	—	—	—	—	—					
19 Bhopal	230	382	191	199	50					
20 Bilaspur	—	407	407	204	204					
21 Coorg	875	1,120	881	1,070	1,032	984	1,356	1,145	1,221	1,324
22 Delhi	—	—	—	—	—					
23 H. Pradesh	755	747	677	537	457					
24 Kutch	—	—	—	—	—					
25 Manipur	—	716	1,213	951	747					
26 Tripura	—	1,075	1,149	1,157	1,178					
27 V. Pradesh	—	319	321	184	399					
28 A & N Islands	—	747	560	896	373					
ALL-INDIA	739	698	688	598	632					

* Relates to Winter Rice

% Relates to *Tabi* Rice.

% Relates to First Crop.

@ Relates to Autumn Rice.

% Relates to *Abi* Rice.

** Based on I.S.I. Crop cutting surveys.

APPENDIX III

Progress of Japanese Method of Paddy Cultivation in India during 1953-54

S. No.	Name of the State	Total Acreage	Actual average yield per acre by local method (in mds.)	Actual average yield per acre by J. Method (in mds.)	Estimated Addl. production by J. Method (in tons)	Estimated addl. yield per acre (in mds.)	Estimated cost of cultivation (in Rs.) Local Method (in mds.)	Estimated cost of cultivation (in Rs.) J. Method (per acre)	Increased return per acre in terms of money by J. Method (in Rs.)	No. of experimental farms on which tried
1	2	3	4	5	6	7	8	9	10	11
1	West Bengal	61,839	20	39	43,000	19.46	130/-	228/-	64/8/-	6
2	Assam	30,000	25	30	5,536	5.16	64/-	78/-	50/-/-	13
3	Uttar Pradesh	35,070	25¾	37	9,600	7.66	115/-	204/-	96/-/-	17
4	Madhya Pradesh	1,460	20	53	2,110	40.46	145/-	220/-	342/-	8
5	Orissa	1,242	22	39	1,004	22.64	61/-	126/-	143/-	8
6	PEPSU	3,727	22	30	1,090	8.18	103/-	156/-	43/-	2
7	Madhya Bharat	15,262	16	32	10,495	19.25	105/-	247/-	45/-	2
8	Travan-Cochin	1,060	43	65	842	22.24	164/-	303/-	220/-	4
9	Mysore	28,070	29	40½	15,216	15.17	212/-	278/8/-	140/-	7
10	Rajasthan	1,962	25	60	1,500	21.40	160/-	271/-	250/-	1
11	Bombay	4,553	31¼	42½	5,654	34.77	119/4/-	304/2/-	349/-	12
12	Saurashtra	95	26	44	51	15.03	199/-	351/-	190/-	2

1	2	3	4	5	6	7	8	9	10	11
13	Coorg	933	33¼	45¾	427	12.81	197/-	304/-	120/-	3
14	Bihar	3,180	12	40	3,204	28.21	100/-	250/-	350/-	20
15	Vindhya Pradesh	1,453	7½	17½	540	10.40	82/8/-	140/10/-	165/-	11
16	Delhi	1,500	15	30	804	15.00	124/-	159/-	145/-	nil
17	Hyderabad	151,966	18	36	78,241	14.41	163/4/-	202/9/-	216/-	7
18	Tripura	50	16	25	18	10.08	Not worked out		54/-	1
19	Bilaspur	13	10¾	15	2	4.30	—do—		100/-	1
20	Bhopal	100	10	30	72	20.16	—do—		150/-	2
21	H. Pradesh	162	26¼	31-3/8	23	4	—do—		33/-	3
22	Kutch	20	Not worked out		14	19.60	—do—		...	1
23	Madras	13,785	34½	48½	6 892	14.00	80/8/-	138/8/-	82/-	8
24	Punjab	38,275	Not received		8,907	6.52	251/12/-	309/10/-		7
25	Andhra	5,923	44	53	1,851	8.75	156/-	216/-	29/-	3
26	Ajmer	—Nil—								
27	Manipur	—Nil—								
28	Andaman Islands	—Nil—								
29	J. & Kashmir	—Nil—								
	Total	4,01,700 acres			1,97,033 tons					
	Average			38.44 Mds.		13.35 Mds.				

Note—The Japanese Method of Paddy Cultivation was not adopted in the States of Ajmer, Manipur, Nicobar and Andaman Islands, and Jammu & Kashmir during 1953-54

APPENDIX IV

Names of first six farmers in each State during 1953-54

Sr. No.	Name of State	Name of six farmers who harvested the highest per acre yield	Yield in mds.
1	2	3	4
1.	Orissa	1. Shri Abdul Wahab	**98**
		2. ,, R.C. Patel	97½
		3. ,, C.B. Naik	90
		4. ,, Benudhau Behra	85
		5. ,, Bushwarbar Mahanty	82
		6. ,, G.D. Sharma	75½
2.	Mysore	1. ,, Appaji Gowda	98
		2. ,, A.S. Bangaru	79
		3. ,, Sidde Gowda	120
		4. ,, Gopalaraje	76½
		5. ,, Doddahonnappa	117
		6. ,, B. Gangadharan	**124½**
3.	Bombay	1. ,, Ram Chandra Bhonsle	**120**
		2. ,, Deoba Raghu Patel	120
		3. ,, Damji Saluji Salade	115
		4. ,, Babu Rao Patil	112
		5. ,, Vyenkat Rao Bhago Patil	103
		6. ,, Yeshwant Bhave	94
4.	Saurashtra	1. ,, Vali Mohd.	**77**
		2. ,, Jiwan Vasta	67
		3. ,, Vithal Ramaji	64½
		4. ,, Mohan Ruda	62½
		5. ,, Kanji Haraji	58
		6. ,, Damaji Kadva	63

1	2	3	4
5.	Coorg	1. ,, V.K.N. Shetty	127½
		2. ,, V.K. Venkatasubha Shetty	132½
		3. ,, B.G. Nangunda	121
		4. ,, A M. Ganapathy	113
		5. ,, K.M. Moonnapa	111
		6. ,, K. Ponnauna	108½
6.	Vindhya Pradesh	1. ,, Mangal Singh	60½
		2. ,, Har Parshad	59¼
		3. ,, H.H.P.P. Singh	59½
		4. ,, A. Pratap Singh	55
		5. ,, M. Partap Singh	50
7.	Delhi	1. ,, Cap. Kanwar Singh	64½
		2. ,, Nair Singh	84
		3. ,, Bhaskar	68
		4. ,, Shashi Bhushahwar	60½
		5. ,, Ch. Kartar Singh	59½
		6. ,, Joginder Singh	50
8.	Assam	1. ,, Dina Nath Dutta	97½
		2. ,, Tukheswar Bera	92
		3. ,, Mukhtiram Goswami	89
		4. ,, Gopal Ch. Barua	88
		5. ,, Kamal Ch. Hazarika	85
		6. ,, Rameshwar Lal Maskara	84
9.	Madhya Pradesh	1. ,, Narayanlal Gopalsao	117½
		2. ,, Dhoduji Ganaji Borkar	95
		3. ,, Nathu Rongdi Tarone	90
		4. ,, A.D. Joshi	87
		5. ,, Shankar Lal Srivastava	83¾
		6. ,, Lakshman Rambhan Pawar	79½
10.	Travancore-Cochin	1. ,, P. Sivagurunatha Pillay	96¼
		2. ,, S. Muthu Krishna Pillay	91½

1	2	3	4
		3. ,, N. Narayanan Unnithan	86¼
		4. ,, A. Sivan Pillay	80½
		5. ,, Thomman Uthuppan	76¼
		6. ,, S.H. Ramasubramanian	74
11.	Himachal Pradesh	1. ,, Jorawar Singh	**64**
		2. ,, Nihal Singh	48
		3. ,, Gunghar	44
		4. ,, Gauru	44
		5. ,, Nanak Chand	40
		6. ,, Tulsi Ram	39¾
12.	Punjab	1. ,, Sham Sher Singh	**96¼**
		2. ,, Manager National Coop. Farm, Garhi Singhan	90¼
		3. ,, Fateh Singh	86¾
		4. ,, Neki Ram	83
		5. ,, Jwind Ram	82¾
		6. ,, Daljit Model Farm, Chopri	79¼
13.	Hyderabad (Dn)	1. ,, Dharmapuram Heemareddy	**145**
		2. ,, Gobadi Anjiah	113¾
		3. ,, Gudimala Seshachari	109¼
		4. ,, Manikrao	105¼
		5. ,, Venkatreddy	102½
		6. ,, Bhoj Reddy	100¼
14.	Madras	1. ,, P.R. Vijayaraghava	**117½**
		2. ,, K. Srinivasa Iyer	79¼
		3. ,, Ekambara Nathar	83
		4. ,, Muthiab Mirasdar	97½
		5. ,, J. Mahadeva Iyer	88
		6. ,, Muthu Kumar	82½
15.	Andhra	1. ,, Meka Ven Kayya	66¼
		2. ,, S. Ramachandra Rao	78¼
		3. ,, Katamreddy Venkataram Riddy	46⅞
		4. ,, M. Venkatramamiah	76¼

1	2	3	4
		5. „ A.V.V. Suryanarayana Raju	**97¼**
		6. „ M. Ramunaidu	**61**
16.	Tripura	1. „ Man Mohan Ghose	
		2. „ Paresh	
		3. „ Abdul Khalek	
		4. „ Tilak Ch. Nara	
		5. „ Syed Abdul Majid	
		6. „ Abdul Malick	
17.	Rajasthan	1. „ K.L. Mehta	**71**
		2. Late S. Jugander Singh	64½
		3. S. Balwant Singh	63½
		4. Shri Madho Singh	61¾
		5. „ Kheraj Ramji	61¾
		6. „ Hira Bechet Sethal	46
18.	Bhopal	1. „ Sambha Murthy	**63¾**
		2. „ Karam Narayan	56
		3. „ Attar Singh	55
		4. „ Darayao Singh	46⅜
		5. „ Ram Singh	41½
		6. „ Bansi Lal	32½
19.	West Bengal	1. „ Basnta Kumar Roy	**161½**
		2. „ Janki Nath Pal	100
		3. „ Gurupada Ghose	103¼
		4. „ Ramratan Koley	102
		5. „ Ratanlal Singh Roy	103¾
		6. „ Jitendra Nath Hati	100¾
20.	Bihar	1. „ Ram Narain Singh	**112**
		2. „ Suchit Narain Singh	98
		3. „ Chugbuli Rai	78¾
		4. „ Bhubneshwar Tewari	73¾
		5. „ Inderdeo Upadhaya	72
		6. „ Ram jodhya Singh	71½
21.	Madhya Bharat	1. „ Ram Singh	**120**
		2. „ Devendra Singh	118¼
		3. „ Mohammed Usaf	112
		4. „ Atamohammed	108
		5. „ Kartar Singh	100½
		6. „ Khayna Lal Jagan Nath	115⅛

1	2	3	4
21.	Uttar Pradesh	1. ,, Umar Beg	81½
		2. ,, Shamshul Khan	70½
		3. ,, Gunchand Lal Kothari	61
		4. ,, Indra Dewan Singh	61
		5. ,, Hafiz Ullah	58
		6. ,, Khiali Ram	57

APPENDIX V

Area put under the Japanese Method of Paddy Cultivation during 1954-55

Sl. No.	Name of the State	Targets (lakh acres)	Progress achieved (in acre)	Remarks
1	2	3	4	5
PART A.				
1.	Madras	1.00	4,89,181	
2.	Bombay	1.00	92,636	
3.	West Bengal	2.00	38,751.96	
4.	Uttar Pradesh	2.00	71,536.65	
5.	Punjab	1.50	44,874.50	
6.	Andhra	1.50	48,474	upto 31.3.55
7.	Bihar	4.00	44,724.81	
8.	M. Pradesh	2.00	13,192	
9.	Orissa	2.50	6,574	
10.	Assam	1.00	5,339.0	
PART B.				
11.	J. & K.	0.20		
12.	M. Bharat	0.30	22,623.03	
13.	Hyderabad	0.50	1,65,652	upto 31.3.55
14.	Mysore	0.20	90,173.30	
15.	P.E.P.S.U.	0.10	12,730	
16.	Rajasthan	0.20	4,293.50	
17.	Travancore-Cochin	0.20	15,021	
18.	Saurashtra	0.20	131.50	
PART C.				
19.	Bhopal	0.10	280.16	
20.	Delhi	—	410.0	
21.	H. Pradesh	0.05	1,620.6	
2.	Manipur	0.05	29.0	

23.	Coorg	0.10	10,936.25
24.	Tripura	0.15	7,453
25.	Vindhya Pradesh	0.25	5,779
26.	Ajmer	—	Campaign not started
27.	Kutch	—	-do-
PART D.			
28.	A & N Islands	—	-do-
	Total	21.10	11,92,416.16 acres.

APPENDIX VI

Progress of work on the Japanese Method of Paddy Cultivation during 1954-55

Sl. No.	Name of item	Achievements
1.	Area under seedbeds	45,469.58 acres
2.	Area transplanted	11,92,416.16
3.	No. of demonstration plots laid	75,302
4.	No. of training Centres opened	3,361
5.	No. of propaganda & training meeting held	97,991
6.	No. of fertilizer depots	8,384
7.	No. of seedstores	2,913
8.	Quantity of fertilizers distributed (on cash & loan)	97,520 tons.
9.	Quantity of improved seeds distributed (on cash & loan)	2,90,262 Maunds
10.	No. of villages covered	53,684

APPENDIX VII

Progress of the Japanese Method of Paddy Cultivation in India during 1954-55

Sl. No	Name of the State	Target fixed under J.P.C. Campaign during 1954-55 (in lakh acres.)	Area brought under J.P.C. method during 1954-55 (in acres)	Estimated average yield obtained by J.P.C. method during 1954-55 (in mds).	Estimated average yield obtained by local method during 1954-55 (in mds).	Estimated additional yield obtained per acre by adoption of J.P.C. method (in mds.)
1	2	3	4	5	6	7
1.	Madras	1.00	4,93,377.00	28.65	22.37	6.28
2.	Bombay	1.00	92,636.00	42.10	26.30	15.80
3.	West Bengal	2.00	38,751.00	28.26	15.58	12.68
4.	Uttar Pradesh	2.00	71,536.65	28.35	21.47	6.88
5.	Punjab	1.60	98,157.00	22.00	14.00	8.00
6.	Andhra	1.50	49,821.00	33.10	25.00	8.00
7.	Bihar	4.00	44,724.81	19.50	9.50	10.00
8	Madhya Pradesh	2.00	13,192.00	57.00	15.00	42.00
9.	Orissa	2.50	6,574.00	33.00	18.00	15.00
10.	Assam	1.00	53,395.00	70.00	18.00	52.00
11.	J. & Kashmir	0.20				
12.	Madhya Bharat	0.30	22,623.03	36.00	12.00	24.00
13.	Hyderabad	0.50	1,65,652.00	32.60	18.10	14.50
14.	Mysore	0.20	90,173.30	46.70	29.70	17.00

1	2	3	4	5	6	7
15.	PEPSU	0.10	12,730.00	30.00	20.00	10.00
16.	Rajasthan	0.20	4,293.50	42.00	22,00	20.00
17.	Travancore-Cochin	0.20	15,021.00	48.40	26.60	21.80
18.	Saurashtra	0.20	20,000.00	26.60	14.50	12.10
19.	Bhopal	0.10	600.00	20.00	10.00	10.00
20.	Delhi	—	410.00	27.00	20.00	7.00
21.	Himachal Pradesh	0.05	1,620.50	27.40	17.00	10.40
22.	Manipur	0.05	29.00	48.00	32.00	16.00
23.	Coorg	0.10	11,000.00	53.46	32.40	21.06
24.	Tripura	0.15	7,453.00	25.00	18.00	7.00
25.	Vindhya Pradesh	0.25	5,779.00	19.50	8.00	11.50
26.	Ajmer	Campaign was not started in these States				
27.	Kutch					
28.	A&N Islands					
	Total	21.10 or say 2 million acres	13,19,548.79 Average on the basis 24 States.	844.62 / 35.20	465.52 / 19.40	379.10 Average additional yield obtained per acre on State 15.80=15.8

Total estimated additional production of paddy achieved in the country during 1954-55=744600 tons

APPENDIX VIII

Financial assistance given to State Governments for intensification of the Japanese Method of Paddy Cultivation during 1952-53 to 1954-55

YEAR	AMOUNT SPENT (Rs.)	PURPOSE
1952-53	3,007	Publicity and propaganda.
1953-54	37,500	Publicity and propaganda.
1954-55	1,89,634	Rs. 40,555 on Publicity and Propaganda. Rs. 65,000 as loan to State Governments for purchase of implements and for raising nurseries etc. Rs. 50,949 as grants to the State Governments to meet establishment charges for publicity, to run administration blocks for demonstrations, as contribution towards training centres and for award of community prizes etc. Rs. 33,130 as subsidy to State Governments for distribution of hoes to cultivators, prize competition and purchase of projectors etc.

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APPENDIX IX

Financial assistance given to the State Governments for intensification of the paddy campaign during 1954-55

Sl. No.	Name of the State.	Amount Sanctioned Loan	Grant	Subsidy	Purpose.
1.	Travancore-Cochin	—	Rs. 6775/-	—	To meet establishment charges for publicity purposes based on Centre's 50% contribution.
2.	Bombay	—	(a) Rs. 21810/-	—	(a) To run administration blocks for demonstration purposes.
			(b) Rs. 5864/-	—	(b) The Central Govt. contribution towards the training centre at Karjet.
			(c) Rs. 6400/-	—	(c) Rs. 2500/- for five sets of models on J.P.C. and Rs. 3900/- for award of community prize at Rs. 75/-each in order of merit to five villages bringing the largest percentage of area under paddy by J. P. C. method.
			(d) Rs. 225/-	—	(d) For award of community prize at Rs. 75/- each in order of merit to villages bringing the largest percentage of area under paddy by J.P.C. method.
3.	Madhya Pradesh	20,000/- 20,000/-	—	—	For the purchase of 2000 implements at 20/- each for interculture.

4. West Bengal	—	--	11,400/-	(a) For distribution of 5,000 hoes to cultivators at subsidized rate of Rs. 5/- each.
	—	—	6,500/-	(b) Central Govt.'s share for prize competition.
5. Rajasthan	—	—	12,000/-	Centre's 50% contribution for the purchase of two projectors and one propaganda van.
6. Pepsu	—	—	3,230/-	For recruitment of 14 Mukaddams 2 each at 7 Tehsils.
7. Vindhya Pradesh	25,000/-	—	—	For raising Central nurseries on the basis of Rs. 1000/- per 1000 acres.
8. Uttar Pradesh	—	Rs. 9875/-		For printing of literature on J.P.C. in regional languages,
TOTAL.	Rs. 65,000/-	Rs. 50,949/-	Rs. 33,130/-	

GRAND TOTAL :— Rs. 1,49,079/-

* * * *

APPENDIX X

Area brought under the Japanese Method of Paddy Cultivation and average yield per acre by local method as well as by Japanese method during 1955-56

Name of State	Area in acre under J.P.C. method.	Average yield per acre by Local method (paddy) (in mds.)	Average yield per acre by Local method (Rice) (in mds.)	Average yield per acre by Japanese method of paddy cultivation. Paddy (in mds.)	Rice (in mds.)	Additional production per acre of paddy by the adoption of JPC method (in mds.)	Additional production per acre of Rice by the adoption of J.P.C. method
Madras	8,00,000	32.55	21.7	34.15	22.76	1.60	1.06
Andhra	3,09,875	...	...	...	...	...	...
Uttar Pradesh	93,790,75	24.38	16.19	30.94	20.63	6.55	4.44
Punjab	91,133	12.2	8.1	18.2	12.1	6.00	4.00
Bombay	1,28,000	23.4	15.6	37.5	25.0	14.40	9.40
Madhya Pradesh	11,000	17.5	11.3	40.9	...	23.40	...
Orissa	13,808	21.0	14.0	47.0	31.33	26.00	17.33
Assam	50,000	22.0		48.0	...	26.00	...
Hyderabad	1,44,674 (Abi)	14.5	9.6	58.5	37.4	44.00	27.8
Mysore	95,822 (Monsoon)	33.6	...	50.4	...	16.80	...
Travancore-Cochin	24,989	12.1	8.0	4.26	28.0	30.50	20.0
Saurashtra	16,034	17.0	11.0	25.0	17.0	8.00	6.0

1	2	3	4	5	6	7	8
PEPSU	8,053	20.0	...	30.0	...	10.00	...
Tripura	8,360	14.25	9.50	22.0	14.50	7.75	5.0
Bhopal	339.50	...	...	24.45	...	...	...
Rajasthan	6,552	22.0	15.0	42	28	20.0	13.0
Vindhya Pradesh	9,637.50	8.0	5.3	20½	13.6	12.50	8.30
Coorg	29,539	30.2	20.1	54.8	36.5	24.60	16.40
Madhya Bharat	25,798	15.0	10.0	40.0	26 75	25.00	16.75
A. & N. Islands	84	21.0	13.6	40.50	26.3	19.50	12.70
Jammu & Kashmir	415	20.0	13.0	26	17.0	7.00	12.00
Bihar	86,727	18.6	12.42	45.6	30.75	27.00	18.33
Himachal Pradesh	2,175.50	25.00	14.90	32.40	19.60	7.40	4.70
West Bengal	35,569	..	11.1	...	23.9	...	12.80
Delhi	334	20.00	...	36.00	...	16.00	...
Total	19,92,759.25						